BLM

U.S. Department of the Interior
Bureau of Land Management

Environmental Assessment

DOI-BLM-CA-N050-2012-45-EA

Rush Fire Emergency Stabilization and Rehabilitation

November 2012

Ken Collum
Field Manager
Eagle Lake Field Office
2950 Riverside Drive
Susanville, CA 96130
(530) 257-0456

1.0 INTRODUCTION

The Bureau of Land Management (BLM) Eagle Lake Field Office is proposing to stabilize and rehabilitate approximately 315,000 acres of BLM-administered lands that have recently been burned over by the Rush Wildfire. The purpose of the Proposed Action is to return public lands burned in a recent wildfire to their natural vegetative character and wildlife habitat integrity. The proposal comprises several field measures that apply emergency stabilization and burned area rehabilitation treatments to public lands located in northeast California and northwest Nevada. The Rush Fire Emergency Stabilization Plan (ESP) and The Burned Area Rehabilitation Plan (BAR), completed in summer of 2012, identify the prescribed treatments in detail.

1.1 Background Information

The Rush Wildfire burned 315,577 acres of primarily sagebrush-steppe vegetation in August 2012. The fire occurred primarily between Ravendale and Wendel, California. The burned project area covered portions of Lassen County in California (271,911 acres) and portions of Washoe County in Nevada (43,666 acres). The fire ranged from 4,020 feet above mean sea level (MSL) along the southern toe of Skedaddle Mountain to 7,964 feet above MSL on top of Observation Peak.

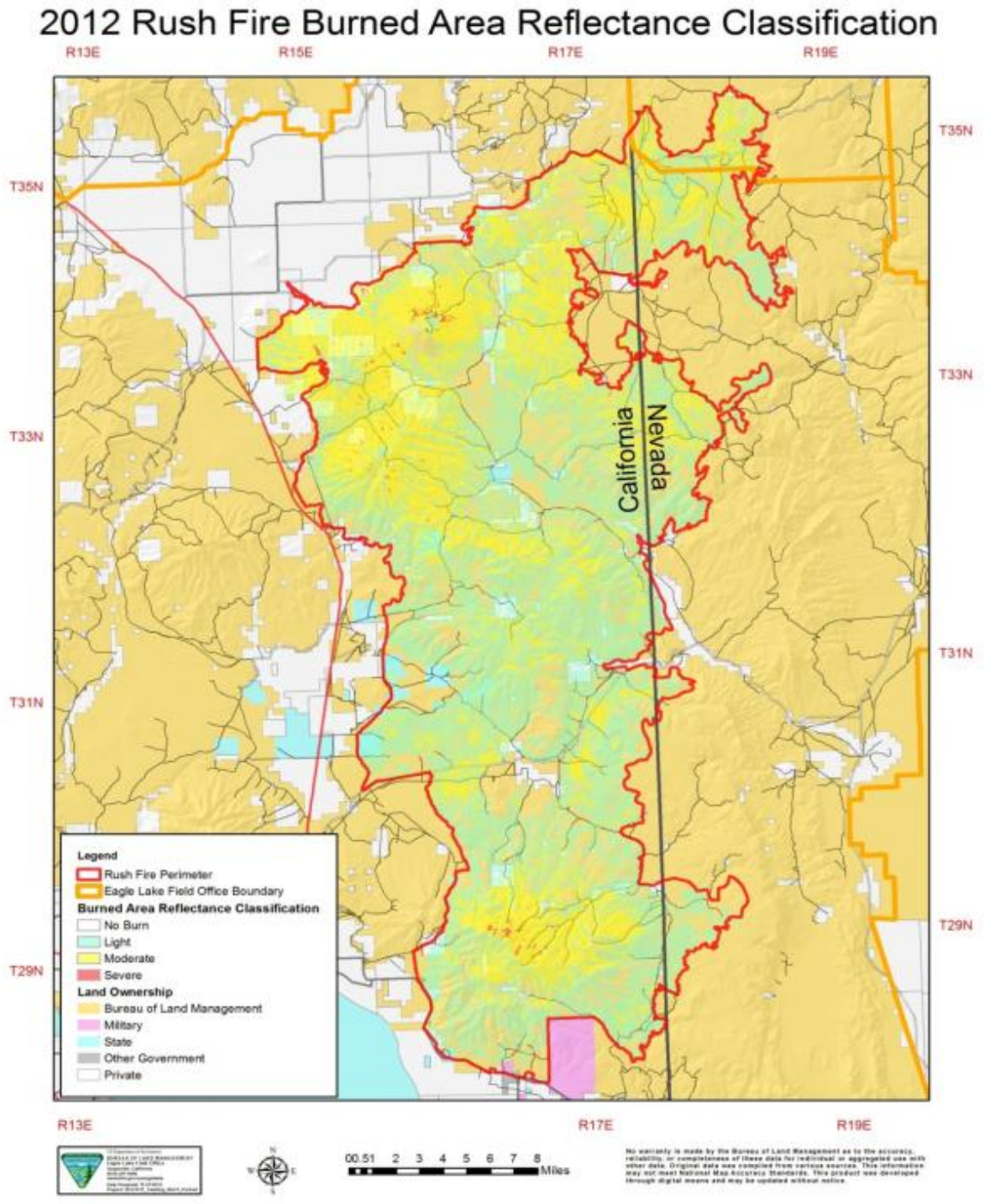
1.2 Purpose and Need

The purpose of the Proposed Action is to stabilize and rehabilitate lands burned by the Rush Wildfire. The wildfire created burn impacts on 315,577 acres that require emergency stabilization and rehabilitation actions for the next two to five years. Vegetation was completely consumed on approximately 243,747 acres within the fire perimeter; the remaining 71,830 acres contain islands of vegetation that were either not burned or slightly burned. The fire consumed approximately 77% of the total native vegetation that had previously provided forage for wildlife species, wild horses and burros, and permitted livestock grazing. The fire consumed a very large portion of the Buffalo Skedaddle Population Management Unit for Greater sage-grouse, and important habitat areas for mule deer and pronghorn. The fire burned approximately 39% of the Twin Peaks Herd Management Area (HMA), 9% of the Buckhorn HMA, and also burned through nine livestock grazing allotments.

The emergency stabilization and rehabilitation measures are needed to reduce soil erosion; provide watershed stability; rehabilitate wildlife habitat; improve water quality; prevent off-highway vehicle incursions in the burn area; monitor and protect newly exposed cultural sites; monitor and prevent invasive plant infestations; facilitate regeneration of endemic plant species burned in the fire; and prevent human safety hazards. Livestock grazing needs to be temporarily closed within the burned portions of nine grazing allotments to allow native and seeded vegetation to recover from fire effects. The populations of wild horses and burros within the Twin Peaks and Buckhorn Herd Management Areas need to be reduced to prevent the horses and burros from succumbing to starvation, detrimental loss of body condition, and/or injury and disease, and to prevent damage to native rangelands, planned seedings, and priority sage-grouse

habitat. The Rush Fire perimeter and the Burned Area Reflectance Classification for the fire are shown on the following map.

Map 1. Rush Fire Perimeter and Burned Area Reflectance Classification



1.3 Summary of Proposed Action

The Proposed Action includes the following emergency stabilization and rehabilitation treatments:

1. **Seeding and Planting of Native Grasses, Forbs, and Shrubs**: Drill seeding on 5,000 acres; Aerial seeding on 26,000 acres; Hand planting on 178 acres with seedling plugs of bitterbrush, mountain mahogany, coyote willow and red willow to provide cover and forage for wildlife.
2. **Riparian Area Erosion Stabilization:** Install a series of 17 low rock grade stabilization structures in Stony Creek to stabilize active erosion and prevent further down cutting of the adjacent meadow. Livestock grazing would be temporarily excluded from the treatment area for a minimum of three years. Hand plant willows and other riparian shrubs on Stony Creek and Upper Smoke Creek
3. **Invasive Plant Inventory and Treatment:** Inventory nine invasive plant infestations within the Rush Fire perimeter to determine their size and extent. Implement herbicide treatments to control all of the new infestations. Annual and biennial species would be manually treated if feasible.
4. **Protective Fence:** Repair and rebuild 11 miles of existing permanent drift and pasture division fences that were burned by the Rush Fire. Replace all burned wooden posts with easy-fence paneling, pipe fencing or rock cairns. Burned fence materials, including wire, would be removed from the site. Repair and rebuild 33 existing fenced exclosures that were burned that are used for the protection of riparian areas and spring developments, and vegetation monitoring. Construct nine new riparian exclosures using two miles of Liberty Fence (pipe-rail fencing) for the construction.
5. **Livestock Grazing Closures:** Close livestock grazing in the burned areas of nine grazing allotments in order to allow the burned and seeded vegetation to successfully recover and/or establish. The closure would occur for a minimum of two growing seasons or until vegetation establishment objectives are met.
6. **Wild Horse and Burro Emergency Gather and Removal:** Remove 663 wild horses and 203 burros from the Twin Peaks HMA, and 79 horses from the Buckhorn HMA to prevent detrimental loss of horse health and body condition. All of the horses and 80% of the burros to be removed are currently residing within the burned area or within a 5-mile buffer of the fire perimeter.
7. **Temporary Travel Restriction on Routes within WSAs:** Implement a temporary travel restriction on 76 designated routes within WSAs in order to prevent erosion and sedimentation within the burned area. All restricted routes would be signed for the public.
8. **Cleanout of Reservoirs and Pits:** Remove excess sediment and debris from 100 water catchments that resulted from increased watershed flow from the burned areas of the Rush Fire.
9. **Wildlife Guzzlers:** Remove ten fire-damaged wildlife guzzlers and install new guzzler tanks, aprons, and protective fencing. Construct protective ¼ -acre fencing around aprons at seven guzzler sites.

10. **Cultural Resources Protection:** A) Control public access to a fire staging area adjacent to the Tommy Tucker Cave and Site LG-1 by placing barrier rocks in the borrow ditch along Highway 320 and along Skedaddle Road to inhibit parking. The informal parking area, access road, and the staging area used during the fire (approximately 2 acres) would be prepared and seeded to restore the area to native vegetation. B) Protect the erosion and degradation of the Indian Springs, Nevada cultural site through seeding, mulching, lop and scatter of downed or standing dead trees, installation of straw wattles and grade dips, and placement of rock barriers and warning signs. C) Implement hazard tree removal on 60 acres and site stabilization measures on five cultural sites.
11. **Recreation and Human Safety Treatments:** A) Hazard Tree Removal on 60 acres; B) Replace/Repair 14 informational road signs for the public.

1.4 Land Use Plan Conformance

The Proposed Action is in conformance with the Eagle Lake Resource Management Plan and record of Decision, April 2008, which states:

Eagle Lake Resource Management Plan, 2008: Section 2.85, page 2-41
Meadows, aspen stands, and other habitats with significant value as wildlife habitat (particularly sage-grouse) and NRHP-quality archaeological sites would receive priority for additional livestock exclusion. When fencing natural water sources, water would be made available for livestock, wildlife, and wild horses outside the fenced area.

Rangeland improvements would be implemented through a variety of methods used in combination on a site-specific basis. These would include prescribed fire, mechanical treatments, biological treatments, chemical agents, seeding with native perennials, maintaining seeded areas, modifying or changing grazing practices, developing and/or maintaining watering facilities (e.g., wells, spring developments, catchments, and new technology for pumping water [solar and wind power]), and new and reconditioned fencing (built to BLM wildlife specifications). Between 60 and 80 miles of new or rebuilt fencing would be built over a 20-year period, if deemed necessary to facilitate other improvements. Old fences that are not compatible with current fence standards would be modified to meet BLM wildlife specifications after BLM determines that they need to be rebuilt.

Eagle Lake Resource Management Plan, 2008: Section 2.8.5, page 2-42
Areas burned by wild or prescribed fire would be rested from livestock grazing for a minimum of two growing seasons. Decisions to re-open burned areas to grazing would be based on monitoring and assessment. Areas may be re-opened in less than two growing seasons only if such use can be shown to meet resource management objectives of the fire recovery plan specific to that site.

By preference, native perennials would be used for seeding. However, crested wheatgrass (and other non-native plants) would be considered for rehabilitation of sites where non-native plants were used in the past. Selective areas with land health assessment ratings of 'At Risk' or 'Unhealthy' would be treated through reseeding and other methods to work towards restoring the plant community. In order for these planting efforts to be successful, the new seedings must be

rested from grazing until the new plants can withstand grazing pressure.

Eagle Lake Resource Management Plan, 2008: Section 2.9.2, page 2-44
Provide and enhance public recreational opportunities, of a developed and undeveloped nature. Ensure that quality customer service is provided, resources are protected, and user conflicts minimized.

Eagle Lake Resource Management Plan, 2008: Section 2.11.2
The long-term health and productivity of soil within the ELFO area would be assured, with no *net* loss of soil fertility. Sedimentation would be controlled, occurring at a rate that does not threaten sensitive resources, or human health and property.

Eagle Lake Resource Management Plan, 2008: Section 2.11.5, page 2-67
Conduct road maintenance at the current rate. Rehabilitate or close roads where needed to protect or restore soil. Where necessary, relocate roads to more suitable locations. Establish properly constructed sediment intrusion buffer zones that extend for at least 50 feet beyond sensitive sites (e.g., bodies of water, sensitive plants, and archaeological sites) and developed property. This primarily concerns roads and trails, but applies also to any soil-disturbing activity that would create significant wind or water-borne sediments that would threaten sensitive resources, property, or human health.

Eagle Lake Resource Management Plan, 2008: Section 2.12.3, page 2-70
Where necessary, take immediate steps to prevent irreparable damage to resources and natural systems. Promote safety and protect human life where natural hazards exist.

Eagle Lake Resource Management Plan, 2008: Section 2.17.7, page 2-110
Mechanical and/or manual treatments: Mechanical equipment will be used to suppress, inhibit, or control herbaceous and woody vegetation. BLM uses wheeled tractors, crawler-type tractors, mowers, or specially designed vehicles with attached implements for such treatments. Manual equipment includes chain saws and axes.

Seeding or planting: Restoration of site-specific areas may involve seeding or planting the appropriate species for the area, to facilitate reestablishment of native vegetation, and for erosion control.

Eagle Lake Resource Management Plan, 2008: Section 2-18.5, page 2-118
Eliminate or control noxious weeds, invasive species, and poisonous plants to preserve or improve wildlife habitat, forest and rangeland productivity, and land health generally. Depending on the species and degree of infestation, the ELFO may implement an IWM approach that involves eradication, population suppression, or limiting dispersal of an invasive species. Selection of an IWM strategy for a particular area would depend on the species and environmental effects of available control methods. These treatments may include a combination of manual, chemical, biological, and cultural methods. Restore disturbed areas to keep invasive species from spreading or causing greater environmental disturbances. Restoration would involve the use of locally suitable native species.

Eagle Lake Resource Management Plan, 2008: Section 2.22.5, page 2-135
BLM will employ a range of management strategies to minimize impacts on water quality and riparian function. Various uses and activities will be allowed within streams, riparian areas, and contributing uplands as long as they do not impede progress toward attaining water quality standards or the goals and objectives for riparian habitats. The following BMPs would be emphasized:

- Implementing vegetation treatments and planting woody riparian species planted where this is most beneficial and desirable.
- Constructing in-stream structures, where suitable.

Eagle Lake Resource Management Plan, 2008: Section 2.23.1, 2.23.5, page 2-138
Water supply (quantity and distribution) would be sufficient to meet beneficial uses and resource objectives in compliance with BLM land health standards. Major beneficial uses are livestock grazing, terrestrial and aquatic wildlife habitats, wild horses, and recreation. Where water supply is inadequate, distribution would be improved or new supplies developed. Maintain and manage water resources to ensure proper distribution and an adequate supply for livestock, wildlife, and wild horses and burros.

Eagle Lake Resource Management Plan, 2008: Section 2.24.4, page 2-140-141
Wild horses and burros would be managed in three HMAs (New Ravendale, Fort Sage, and Twin Peaks) according to appropriate management levels based on vegetation and population monitoring.

Manage wild horses and burros in accord with the Wild Free-Roaming Horses and Burros Act (1971, as amended) and with other laws and regulations that may apply.

Maintain horse and burro populations within AMLs appropriate for each HMA. Reevaluate and adjust AMLs where and when indicated.

1.5 Authority, Laws, Regulations, and Other Plans

The Rush Fire Emergency Stabilization and Rehabilitation Plan will be implemented according to the following authority and policies. This includes livestock closures, and the emergency wild horse and burro gather for the Twin Peaks and Buckhorn Herd Management Areas.

- 43 CFR 46.150: Emergency Responses
- BLM Handbook H-1790-1 - National Environmental Policy Act Handbook – (Public), 2.3 Emergency Actions
- BLM Handbook H-1742-1 Burned Area Emergency Stabilization and Rehabilitation Handbook (Public)
- TITLE 43: PUBLIC LANDS: INTERIOR, PART 4100—GRAZING ADMINISTRATION—EXCLUSIVE OF ALASKA, Subpart 4190—Effect of Wildfire Management Decisions§ 4190.1 Effect of wildfire management decisions. (a) Notwithstanding the provisions of 43 CFR 4.21(a)(1) (Hearings and Appeals), when BLM determines that vegetation, soil, or other resources on the public lands are at substantial risk of wildfire due to drought, fuels buildup, or other reasons, or at

immediate risk of erosion or other damage due to wildfire, BLM may make a rangeland wildfire management decision effective immediately or on a date established in the decision. Wildfire management includes but is not limited to: (1) Fuel reduction or fuel treatment such as prescribed burns and mechanical, chemical, and biological thinning methods (with or without removal of thinned materials); and (2) Projects to stabilize and rehabilitate lands affected by wildfire.

- BLM Manual 4720 – Removal (Public) .22 Emergency Situations.
  Emergency situations are defined as an unexpected event that threatens the health and welfare of a wild horse or burro population, its habitat, wildlife habitat or rangeland resources and health. Examples of emergencies include disease or fire, insect infestation, or other events of a catastrophic and unanticipated nature that affect forage and water availability for wild horses or burros. The key is that emergencies occur suddenly and require immediate action.
- BLM Handbook H-4700-1 Wild Horses and Burros Management Handbook (Public), 4.7.2 Emergencies
- 43 CFR Subparts 4180.1 and 4180.2: Direct application of BLM's standards for land health and require that vegetation meet, or be making significant progress toward meeting, the standards for land health— including biotic integrity and associated standards—while simultaneously supporting appropriate uses of the land.
- The Public Rangelands Improvement Act (1978)
- BLM Manual 4180—Rangeland (Land) Health Standards
- BLM Manual Supplement, California State Office Handbook H-1745—Native Plant Materials Handbook, release CA 1-243, (09/13/01)
- BLM Manual 1745—Introduction, Transplant, Augmentation, and Re-establishment of Fish, Wildlife, and Plants
- Master MOU between the California Department of Fish and Game and the USDI-Bureau of Land Management
- BLM Manual 9112 Bridge and Culverts, 0.4 Maintenance: Maintenance management entails inspection, evaluation, planning, scheduling, procuring materials, and using personnel and equipment to keep a structure in condition to serve its purpose and provide a safe, uninterrupted traffic flow.
- BLM Manual 9130 – Signs 03 Authority. A. Federal Land Policy and Management Act of 1976. B. Highway Safety Act of 1966 (as amended)
- BLM Manual 7200, Water Resources
- President's Clean Water Action Plan
- MOU with the California Water Resource Control Board for Planning and Coordination of Non-Point Source Water Quality Policies and Activities (Feb. 93)
- Nevada Water Quality Standards (Nevada Administrative Code 445A.118 to 445A.225)
- Executive Order 11988—Floodplain Management

- BLM Manual 1740, Handbook 1741-1, Fencing. Chapter VI. Fence Maintenance. Fences must be maintained in a usable condition, consistent with the original as-built standards.
- BLM Manual 9015 - Integrated Weed Management
- BLM H-4120-1 .37C. Maintenance Responsibilities: Maintenance of range improvements must be performed in a timely manner to assure that improvements remain in a useable condition, and serve the purpose for which they were intended.
- BLM Manual 6840 Special Status Species Management
- BLM Manual Section 6500 Wildlife and Fisheries Management
- Bald and Golden Eagle Protection Acts, as amended (1978)
- Conservation Strategy for Sage-Grouse (*Centrocercus urophasianus*) and Sagebrush Ecosystems within the Buffalo-Skedaddle Population Management Unit (Northern California Sage-Grouse Working Group 2006)
- BLM Instruction Memorandum No. 2012-043, Sage-Grouse Interim Management IM, Greater Sage-Grouse Interim Management Policies and Procedures
- Migratory Bird Treaty Act, as amended (1998)
- Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (66 FR 3853) (2001)
- MOU between the U.S. Department of the Interior Bureau of Land Management and the U.S. Fish and Wildlife Service To Promote the Conservation of Migratory Birds (2010)

The Proposed Action is in conformance with the *Wild Free-Roaming Horses and Burros Act of 1971* (as amended), applicable regulations at 43 CFR § 4700 and BLM policies.

The Proposed Action is also in conformance with the *Wilderness Study Area Manual 6330,* Section 10. Wild horse and burro management. a. General. Wild horse and burro herds are managed in WSAs only within geographic areas identified as having been used by a herd as its habitat in 1971 as directed by the Wild Free-Roaming Horse and Burro Act. Wild horses and burros are managed to remain in balance with the productive capacity of the habitat; this includes managing herds so as not to impair wilderness characteristics. Wild horse and burro populations must be managed at appropriate management levels so as to not exceed the productive capacity of the habitat (as determined by available science and monitoring activities), to ensure a thriving natural ecological balance, and to prevent impairment of wilderness characteristics, watershed function, and ecological processes. The BLM should limit population growth or remove excess animals as necessary to prevent the impairment of the WSA.

1.5.1 Environmental Assessments, other BLM Documents

The following documents contain information from prior NEPA analyses to which this EA is tiered, and BLM decisions related to land health assessments, livestock grazing, wild horses, and other resources within the project area:

1. BLM Environmental Assessment, DOI-BLM-CA-N050-2010-05-EA, *Twin Peaks Herd Management Area Wild Horse and Burro Gather Plan*, July 2010
2. BLM Environmental Assessment, DOI-BLM-CA-N050-2012-50-EA, *Buckhorn and Coppersmith Herd Management Areas Wild Horse Population Management Plan,* August 2012.
3. BLM *Land Health Evaluation and Determination for the Observation Allotment,* 2009
4. BLM *Land Health Evaluation and Determination for the Winter Range California and Nevada Allotments,* 2008
5. BLM Decision Record, *Notice of Final Multiple Use Decision for the Twin Peaks Allotment, January 2001*
6. BLM Report, *Twin Peaks Allotment Monitoring Evaluation Report*, October, 2000
7. BLM Decision Record, *Notice of Final Multiple Use Decision for the Observation Allotment,* August 1998
8. BLM Environmental Assessment, CA-350-1998-14, *Attainment and Maintenance of Appropriate Management Levels of Wild Horses and Burros in the Observation South and Observation North Home Ranges of the Twin Peaks Herd Management Area,* 1998
9. BLM Environmental Assessment, CA-350-1998-20, *Implementation of the Management Recommendations from the Final Observation Allotment Monitoring Evaluation Report,* 1998

1.6 Resource Issues

The following resources have been evaluated to determine if they are resource issues that may be impacted by the Proposed Action. All resources that are rated as "May Impact" are discussed and analyzed in Section 3.0 Affected Environment and Section 4.0 Environmental Consequences.

Table 1.6 Resource Issues

Critical Element	No Impact	May Impact	Not Present	Rationale
Air Quality/ Global Climate Change	X			The proposed action may involve some future contribution of greenhouse gases, but contributions would not have a noticeable or measurable effect, independently or cumulatively.
Area of Critical Environmental Concern		X		The Buffalo Creek Canyons and Pine Dunces ACECs are located within the Rush Fire Perimeter. See Section 3.1 and 4.1
Cultural Resources		X		The project area has abundant cultural resources that were impacted by the Rush Fire. See Section 3.2 and 4.1
Environmental Justice	X			The activities inherent to the proposed action are not of the nature and scope that would affect this element.
Farmlands, Prime or Unique			X	This element is not present within or near the area determined to be influenced by the proposed action.
Floodplains			X	This element is not present within or near the area determined to be influenced by the proposed action.
Livestock Grazing		X		Livestock grazing is permitted in nine grazing allotments within the fire perimeter and the forage capacity has been impacted by the fire. See Section 3.11 and 4.9
Migratory Birds		X		See Sections 3.8 and 4.6.
Noxious Weeds and Invasive Plants		X		Several noxious weed species are present within the Rush Fire Perimeter. See Section 3.6 and 4.5
Native American Religious Concerns	X			Consultation and Field Tours of the project area will be conducted with local tribes if requested.
Recreation and Human Safety		X		Recreation elements within the Rush Fire have been affected. See Section 3.12 and 4.10
Riparian/Wetlands		X		The project area has several riparian/wetland sites that were impacted by the Rush Fire. See Section 3.4 and 4.1
Soils		X		The project area has several soil types that were impacted by the Rush Fire. See Section 3.3 and 4.1
T&E Fauna/Flora			X	No federally listed threatened or endangered (T&E) wildlife species or habitats are known to occur within the project area.
Upland Vegetation/ Special Status Plants		X		The project area has several native upland plant communities that were impacted by the Rush Fire. See Section 3.5, 3.7 and 4.5.
Waste - Hazardous			X	This element is not present within or near the area determined to be influenced by the proposed action.
Water Quality - Surface		X		Surface water quality may be impacted by the Rush Fire. See Section 3.4 and 4.1
Wild & Scenic Rivers	X			A segment of Upper Smoke Creek lies within the Rush Fire Perimeter that is recommended as suitable for designation as a Wild and Scenic River, however the river segment was not damaged by the fire.
Wild Horses, Mules, and Burros		X		The Twin Peaks and Buckhorn Herd Management Areas have been impacted by the Rush Fire. See Section 3.10 and 4.8
Wilderness Study Areas		X		The Rush Fire impacted portions of seven wilderness study areas: Twin Peaks, Buffalo Hills, Poodle Mountain, Five Springs, Dry Valley Rim, Skedaddle, and Bitterbrush Instant Study Area. See Section 3.9 and 4.7
Wildlife and Fisheries		X		Habitat for many wildlife species has been impacted by the Rush Fire. See Sections 3.8 and 4.6.

2.0 ALTERNATIVES

This section describes the Proposed Action Alternative and the No Action Alternative, which are analyzed in detail in Section 4.0 Environmental Consequences. Alternatives include the following:

Alternative A. (Proposed Action) – Implement Emergency Stabilization and Rehabilitation Treatments

Alternative B. (No Action): Do Not Implement Emergency Stabilization and Rehabilitation Treatments

2.1 Alternative A. (Proposed Action) – Implement Emergency Stabilization and Rehabilitation Treatments

The BLM would implement specific Emergency Stabilization and Rehabilitation treatments to stabilize the effects of the Rush Fire on approximately 315,000 acres. Each treatment type is discussed in detail in the *Rush Fire Emergency Stabilization Plan and the Burned Area Rehabilitation Plan*. The proposed treatment specifications include the following actions:

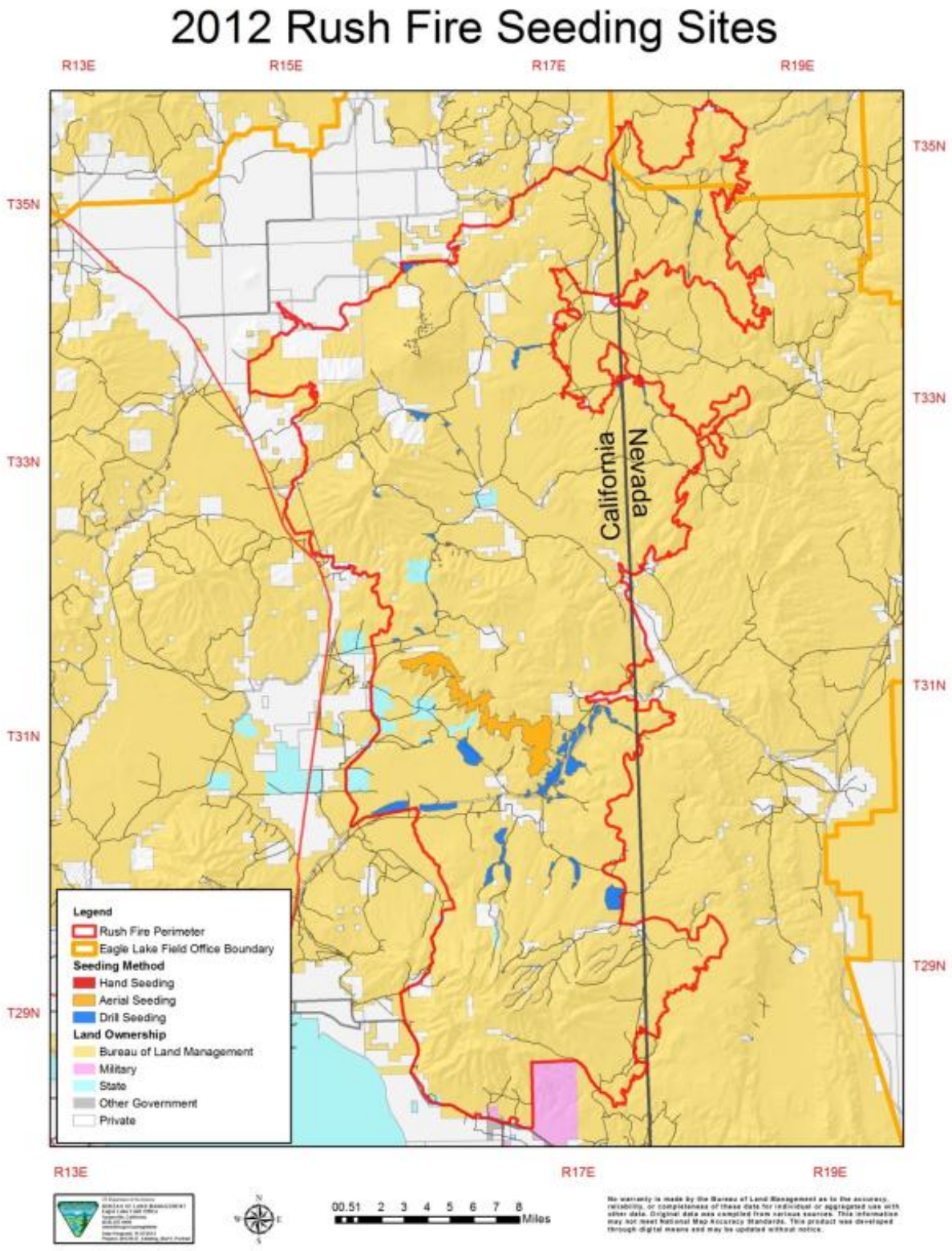
2.1.1 SEEDING AND PLANTING

Seeding and planting treatments are designed to re-introduce native perennial plants that will reduce the loss of soil from wind and water erosion, improve plant community diversity, prevent invasive non-native plant establishment, and rehabilitate wildlife habitats. Treatments include site and seedbed preparation, seed application, seed covering, improving seed to soil contact, post seeding soil firming, planting seedlings, saplings and other plant materials. Seeding and planting treatments may be combined with mulching or site protection treatments to minimize disturbance until plants become established.

***Site and Seedbed Preparation*.** Implementation of proper site and seedbed preparation would be used to ensure the germination and survival rates of desirable species. Due to cost and logistical constraints associated with the vast size and remoteness of the burned area, seedbed preparation is likely to occur only on small accessible sites such as newly constructed staging areas, and in areas of critical wildlife habitat losses. When seedbed preparation is conducted, it will likely be done by hand crews with rakes and rollers. In areas accessible by pre-existing trail or roadway, ATV's could be used. Some tree falling or slash removal may be necessary prior to seeding.

***Seeding*.** Seeding methods would include drill seeding, hand broadcast application, and aerial seeding in locations shown on Map 2. Aerial seeding does not involve ground disturbance at the seeding site. Ground based broadcast seeding could be conducted by vehicle with a seed spreader, but is more likely to be done with a hand held spreader. Seed may be sewn by *rangeland drill* on vehicle accessible sites where the slope is less than 30%, rocks and other obstructions are minimal, and the area has a high priority for vegetative cover. Rangeland drills do not require the extensive seedbed preparation needed for other drilling equipment. Seed mixtures are listed in Appendix B. Treatment effectiveness for all seedings and plantings would be monitored as outlined in Section 2.1.13.

Map 2. Planned Emergency Stabilization and Rehabilitation Seedings



Planting. Hand planting seedlings, saplings, and other plant materials would be used when seeding success is unlikely, at high wildlife priority areas or when it is critical to establish vegetation quickly in order to stabilize erosive soils or improve important wildlife habitats. Bare root stock or contained stock is typically used for shrub and tree species. Holes are hand dug and plant materials set at appropriate depth and spacing. The disturbance associated with hand plantings consists of the area within a 6-8" radius of the plant and foot traffic from the planter.

Drill Seeding

The BLM would seed native perennial plants (grasses, shrubs and forbs) by drill seeding on approximately 5,000 that are rated as moderate to high vegetation mortality and burn severity, as shown on Map 2. These treatments would be implemented to maintain ecological stability, restore wildlife habitat, minimize invasion of cheatgrass and invasive plants, and minimize topsoil loss and fugitive dust from areas having high wind erosion hazard. Seed mixes would contain native species that are adapted to the sites as specified in Appendix B.

Native seed would be applied concurrent with the fall/winter moisture periods between October and December 2012 or the spring of 2013 to maximize the probability of success. First year treatment objectives include stabilization of the soil surface, reducing topsoil loss, improving soil infiltration of moisture, providing competition for invasive non-native species, and replacing organic litter which was consumed by the fire. It is expected that vegetation establishment will be successful on all sites although the presence or absence of timely moisture could be a limiting factor. Cultural Resource Treatment Clearances would be completed before any treatments are implemented.

Drill seeding will be allowed within Wilderness study Areas because it is not expected that these areas will be able to stabilize and restore naturally to their pre-fire condition. Due to the severity of the fire disturbance, existing native seed sources are no longer available across much of the fire area. This, in combination with the threat of invasive species, makes the progression to a functioning ecological state unlikely. Active restoration treatments (e.g. drill seeding and weed control treatments) are part of the Proposed Action to avoid the further loss of plant community function, naturalness, and Wilderness Character. This management goal is supported by Wilderness Study Area Manual 6330, exceptions to non-impairment 1.6.C.2 parts c and f.

Aerial Seeding

The BLM would aerial seed native perennial plants (grasses, shrubs and forbs) on approximately 26,000 acres (shown on Map 2) that are rated as moderate to high vegetation mortality and burn severity in areas that are unsuitable for ground seeding due either to soils surface conditions, terrain, or accessibility. Aerial seedings are designed to maintain ecological stability, minimize invasion of cheatgrass and noxious weeds; and to stabilize areas identified as having high wind erosion hazard in order to minimize topsoil loss and fugitive dust. Seeding would be accomplished by aerial application of seed by rotor aircraft. Seed will be applied aerially and, where possible, seed will be incorporated by "dragging" in order to improve probability of success. Two seed mixes are proposed that utilize species adapted

to their respective ecological communities, as listed in Appendix B. Seed would be applied concurrent with fall/winter moisture period between November 2012 and April 2013, and incorporated where possible and appropriate.

Wildlife Habitat Planting

In order to restore important wildlife habitat, the BLM would hand plant approximately 178 acres with seedling plugs of bitterbrush (*Prushia tridentata*), mountain mahogany (*Cercocarpus ledifolius*), coyote willow (Salix exiqua), and red willow (Salix laevigata). These seedings are designed to provide cover and forage for at least 250 wildlife species that inhabit sagebrush habitats and interspersed riparian/meadow habitat including sage-grouse, mule deer, pronghorn, and migratory birds. It would also provide vegetation needed for ecological site dynamics.

The BLM plans to hand plant bitterbrush and mountain mahogany seedlings on Observation Peak and the Skedaddle Mountains. The BLM plans to hand plant willow cuttings adjacent to Stony Creek and Upper Smoke Creek.

1. **Observation Peak:** This treatment would consist of hand planting 75 acres of bare-root seedling plugs of bitterbrush (*Prushia tridentata*) and mountain mahogany (*Cercocarpus ledifolius*) in pre-selected areas on Observation Peak. Planting would take place in the late fall to early winter. Prior to this activity the species discussed will be grown out by a local grower.
2. **Skedaddle Mountains:** This treatment would consist of hand planting 75 acres of bare-root seedling plugs of bitterbrush and mountain mahogany in pre- selected areas of the Skedaddle Mountains. Planting would take place in the late fall to early winter of 2013. Prior to this activity the species discussed will be grown out by a local grower.
3. **Upper Smoke Creek:** This treatment would consist of 27 acres of hand planting cuttings of coyote willow (Salix exiqua). Cuttings and hand equipment will be carried in to the site and planted in appropriate places. This action will take place in the spring of 2013 and continue again in the fall of 2013.
4. **Stony Creek:** This treatment would consist of hand planting cuttings of red willow (Salix laevigata) for wildlife habitat, bank stabilization and riparian area function on approximately one acre. The meadow adjacent to Stony Creek is not expected to recover naturally to its original ecological state for several years. In conjunction with the soil stabilization project hand planting basin big sagebrush and bluebunch wheatgrass in appropriate places along the southern edge of the meadow would provide cover and forage for several species, including sage-grouse. Seed, cuttings and equipment will be hand carried in to the site and planted in pre-selected locations.

2.1.2 RIPARIAN AREA EROSION STABILIZATION

Erosion stabilization structures are designed to control erosion caused by high velocity of water moving over the soil, sediment flow, and streambank erosion. Installation of erosion barriers will control these erosional factors in burned areas by reducing uninterrupted slope length, increasing soil particle deposition, and improving opportunities for infiltration.

The riparian area and meadow adjacent to Stony Creek has a head cut at the lower end that is beginning to destabilize the meadow. The meadow is functioning and has wetland plant species in the main flow channel. A series of low rock grade stabilization structures would be constructed to stabilize active erosion and prevent further down cutting of the meadow. These actions would protect and expand the moisture storing areas of the landscape. Furthermore, the project will restore dispersed flow, increase infiltration at every opportunity, and cultivate restorative plant communities to build soil. This will increase the forage and cover value for wildlife and promote biodiversity.

The BLM would install 17 low rock weirs in the main stream channel and tie them into the right and left banks. The weirs would be located along the stream channel at an average distance of 110 feet apart. Individual weirs may range from 45 feet to 260 feet apart. Approx. 1,800 feet of the stream channel would be treated and 30 acres of meadow would be protected. Native rock from the rubble along the canyon walls would be used as the building material. The rock weirs will concentrate low flows to the center of the channel while higher flows will be able to spread out and the weirs will be minimally disruptive to these high flows.

The weirs would be constructed to have a crest of one foot or less rise in grade, and would start downstream at a hydraulically stable channel section. Each successive weir would be placed no farther upstream than when the channel is at the same elevation as the downstream weir crest. As the head cut deepens, the weirs may be built higher as long as the grade change from the downstream weir is one foot or less. Each weir will have an exit apron equal to 4-6 times the elevation change above the channel. These exit aprons have been best described to resemble rock lined low water crossings.

The active erosion area of the head cut (one) will be sloped back to a 3:1 grade. Filter fabric would be placed on grade and rock would be placed over the filter fabric. Willow cuttings would be placed between the rock and through the filter fabric. The fabric would be keyed in the upstream face with willow cuttings placed in the keyway.

Livestock grazing would be temporarily excluded from the treatment area for a minimum of three years and limited grazing should be implemented for an additional two years.

2.1.3 INVASIVE PLANT INVENTORY AND TREATMENT

This treatment would provide for the inventory and control of known invasive plant infestations within the Rush Fire perimeter prior to seed-set and maturation. The BLM would implement inventories and treatments to control nine California- and Nevada-Listed noxious weeds to prevent them from spreading into non-infested areas of the burn. Integrated pest management techniques (herbicides, biological, mechanical, and cultural control methods) would be used as appropriate to prevent the spread and establishment of noxious weeds within the fire area. Herbicides would be applied in conjunction with BLM policy, appropriate NEPA documents, and in strict accordance with an approved pesticide use proposal and the herbicide label. All invasive and noxious species treatment will be in compliance with BLM Policy and the integrated Weed Management Program, BLM Lands, Surprise, and Eagle Lake

Field Offices, Nevada Lands Portion, Environmental Assessment (EA) EA# CA-350-04-01, April 2004, DNA 2012-CA-350-01. Appropriate buffer zones would be employed to protect special status species habitat, springs, riparian sites, and other wetland habitats. Invasive plants and noxious weeds that exist within the fire perimeter are shown in Table 2.1.3.

Table 2.1.3 Invasive Plants and Noxious Weeds within the Rush Fire Perimeter

Species	Acres
Canada Thistle (*Cirsium arvensa)*	9
Dyers Woad (*Isatias tinctoria)*	1
Halogeton (*Halogeton glomertaus)*	6
Hoary Cress (*Lepidium draba)*	1
Perennial Pepperweed (*Lepidium latifolium)*	19
Russian Knapweed (*Acroptilon repens)*	24
Russian Olive (*Elaeagnus angustifolia)*	1
Scotch Thistle (*Onopordum acanthium*)	84
Yellow Starthistle (*Centaurea solstitalis*)	8
Total	153

Within the fire perimeter, invasive plants and noxious weeds would be inventoried systematically. Roads and parking areas that were utilized by fire engines and other equipment are considered important vectors and will be a high priority for inventory. Roads will be inventoried twice per year adjacent to the roadbed, and within a distance of 100 yards into the burnt area.

Past fires have indicated that Scotch thistle and yellow starthistle have a rate of spread that is approximately 200% from its original infestation, therefore inventory would be conducted based on known infestations, within riparian areas, and where known bucket drops occurred.

Infestations of Russian olive, Russian knapweed, hoary cress, halogeton, dyers woad, and Canada thistle would be monitored to determine if they are expanding.

Herbicides would be used to treat all of the new infestations of invasive and noxious species listed above. Annual and biennial species, if the infestation is small, would be manually treated.

2.1.4 TREE REMOVAL ALONG ROADS AND TRAILS

The BLM would remove approximately 40 burnt trees adjacent to Buckhorn Backcountry Byway and Rye Patch Road that have been identified to be hazardous to human safety as these are frequently traveled access roads. These areas contain trees that are unstable due to fire damage and my fall on the road due to high winds or erosion. The treatments would ensure human safety along identified roads during any human activities. The complete removal of hazardous trees from identified roadsides will eliminate the human life and safety hazard. Certified sawyers would cut and buck hazardous trees, while other crew members

would carry the materials to a safe distance of at least 20 feet away from the road.
Cultural resource assessments found that rock art sites located within Smoke Creek Canyon may be at risk from several burned juniper trees that potentially may harm petroglyph panels, including those at Bruff's Rock, an archaeological site listed on the National Register of Historic Places (NRHP). Additionally, two rock rings associated with a large lithic scatter in the vicinity of Garden Lake are at risk from a single large juniper tree that has had its root system compromised by the fire. Removal of hazard trees will eliminate the potential for irreparable harm to these significant non-renewable heritage resources. Hazard tree removal would be at the following sites:

1. Bruff's Rock (CA-LAS-2221, 33.17.13.8
2. Site 33.1.713.17
3. Site 33.17.12.2
4. Site 33.17.12.6
5. Site 33.17.12.1
6. Site 35.18.12.1 (Garden Lake)

The BLM would identify trees needing removal adjacent to petroglyph panels or rock rings. The trees would be felled by chainsaw, limbed and bucked into 12"-24" rounds. The limbs would be scattered off site and the rounds would be removed from the site.

2.1.5 PROTECTIVE FENCE

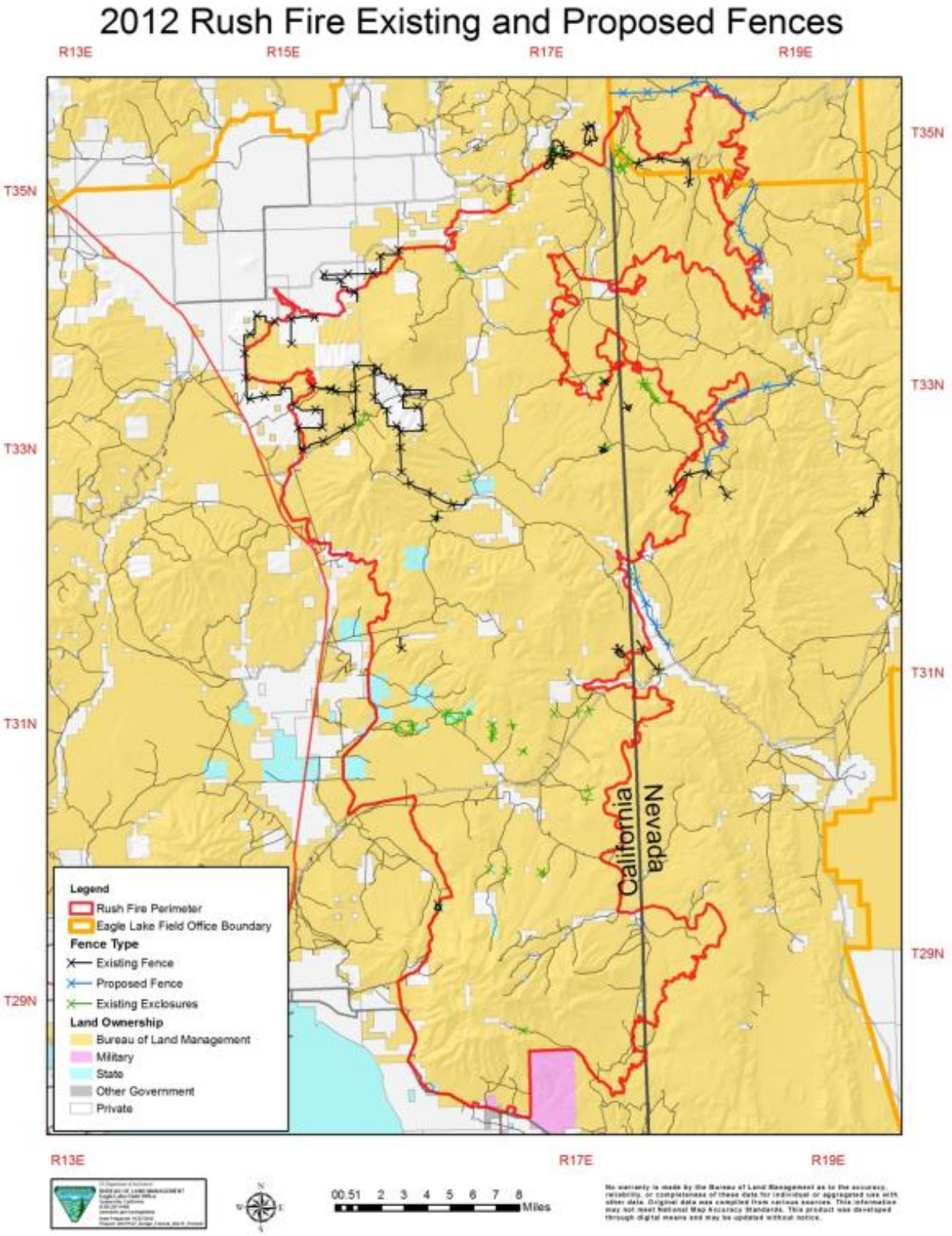
Permanent Fence

The BLM would repair and rebuild 11 miles of existing permanent drift and pasture division fences that were burned by the Rush Fire, as shown on Map 3. Fence work would be accomplished by replacing all burned wooden posts with easy-fence paneling, pipe fencing or rock cairns. Any existing fence materials, i.e. T-posts and wire, will be reused where feasible. T-posts and wire determined to be no longer sustainable will be replaced by new materials. Burned fence materials, including wire, would be removed from the site. Reconstructed fences would be used to protect seeded areas or areas being managed for natural recovery, and to allow exclusion from livestock and wild horse grazing. Fences would be re-established on original fence line locations.

The BLM would also repair and rebuild 33 existing fenced exclosures (shown on Map 3) that were burned that are used for the protection of riparian areas and spring developments, and vegetation monitoring. These repairs would include approximately 28 miles of fence materials. The BLM would also construct nine new riparian exclosures using two miles of Liberty Fence (pipe-rail fencing) for the construction.

All of the new and existing fences occur within the Buffalo Hills, Twin Peaks, Skedaddle Mountains, Five Springs, and Dry Valley (north end) Wilderness Study Areas. Pending the completion of a "minimum tool analysis" some areas may need the use of a helicopter sling load from the Ravendale Fire Station.

Map 3. Planned Emergency Stabilization Fence Repair and Construction



Temporary Fence

The BLM would construct approximately 15 miles of new temporary pasture division fences within the Twin Peaks Allotment, to allow livestock permittees to use pastures that were not burned by the Rush Fire.

Protective Fences in Wilderness Study Areas

All of proposed new fencing is within the Twin Peaks and Buffalo Hills WSAs. The new riparian exclosures will be constructed using pipe-rail fencing, which is better suited in areas with wild horses and burro use. In addition, the pipe-rail fence can be utilized to protect sensitive areas affected by future fires.

2.1.6 CULTURAL SITE PROTECTION

This treatment would entail assessment of known National Register (NR) or potentially eligible prehistoric and historic archaeological sites for post-fire damage and potential risk from erosion, looting or vandalism. This treatment may also provide for emergency actions on those easily accessible sites that are deemed to be highly sensitive to looting.

Cultural Resources Law Enforcement

Looting, site disturbance and vandalism of cultural and heritage resources are known to occur within the Rush Fire perimeter. Due to the reduced ground cover and increased visibility as a result of the wildfire, cultural resources are much more visible and exposed, and are at higher risk of vandalism. Risks to cultural resources from this exposure can be minimized by law enforcement patrols at selected sites and enforcement of closed areas. Law enforcement officers shall have authority to take action on artifact collectors, looters and closure violations.

Cultural Resources Site Protection

Tommy Tucker Cave (Site 29.16.33.00) and Site LG-1

The Tommy Tucker Cave is a significant archaeological site along Highway 320 (Wendel Road) at the southern edge of the Rush Fire. The contents of the cave were not impacted by the fire, but the visibility and access were affected so that the site has much more visibility to the public. Treatments have been are designed to block the access to a fire staging area adjacent to the site, and to decrease the visibility of the access road and trail in order to reduce impacts from increased visitation.

The BLM would control the access to the Tommy Tucker Cave (Site 29.16.33.00) and Site LG-1 by placing barrier rocks in the borrow ditch along Highway 320 and along Skedaddle Road to inhibit parking. The informal parking area, access road, and the staging area used during the fire (approximately 2 acres) would be prepared and seeded to restore the area to native vegetation. Once these treatments are completed, it is expected that user created trails will deteriorate and naturalize if visitation is controlled. Signs would be installed and the site would be monitored. This treatment will ensure that significant and non-renewable heritage resources will not be compromised by post-fire events – specifically, increased visitation by

the curious public.

Deep Creek – Site 31.16.24.04

The BLM would drill seed native species on approximately 20 acres of the site and apply Wood Straw mulch to cover the entire alluvial fan, toe slope and terrace that defines the northern and western portions of the site. Additional protection measures would include installing 50 rice straw wattles in 3 ft. lengths within and perpendicular to the flow on channels that are forming within the fan, and restricting on-site parking by placing rock barriers at likely parking locations alongside both north and south sides of the road within site boundary.

Indian Spring (Mixie Flat) – Site 33.18.23.00

The BLM would apply Wood Straw mulch to cover approximately 23 acres of the slopes and terrace that defines the southern and western portions of the site. Additional protection measures would include installing 10 rice straw wattles in 8 ft. lengths within and perpendicular to the flow on channel formed by road on north side of site. Rolling dips would be constructed along the road on the north side of site. Dips will be constructed by hand crews and not mechanical means. On-site vehicle movement would be restricted by placing rock barriers on the road end above site area, and installing ARPA warning signage at the historic spring development. In addition the BLM would lop and scatter material available on site along the ridgetop and upper slopes of site area.

Hazard Tree Removal

Six cultural resource sites would have hazard trees removed to prevent damage to the sites, as described in Section 2.1.4.

Cultural Resources Treatment Clearances

Cultural resource inventories would be conducted on areas proposed for ground disturbing stabilization and rehabilitation treatments (fence construction, drill seeding, etc.). These inventories would be conducted prior to implementation of the proposed ground disturbing stabilization and rehabilitation treatments in order to identify and avoid any cultural resources needing protective measures.

Inventories would be in accordance with the State Protocol Agreements between the California BLM and the California and Nevada State Historic Preservation Offices (SHPO). Resources, except those previously determined Not Eligible by the BLM and SHPO, or having been fully mitigated, would be flagged for avoidance during stabilization and rehabilitation activities. Flagging would be removed as soon as possible after stabilization and rehabilitation treatments to minimize the potential for looting and vandalism.

2.1.7 WILD HORSE AND BURRO EMERGENCY GATHER AND REMOVAL

This environmental assessment is tiered to the Environmental Assessment (EA) for the *Twin Peaks Herd Management Area Wild Horse and Burro Gather Plan* (DOI-BLM-CA-N050-2010-05-EA), July 2010 and the Environmental Assessment (EA) for the *Buckhorn and Coppersmith Herd Management Areas Wild Horse Population Management Plan,* (DOI-BLM-CA-N050-2012-50-EA), August 2012.

The BLM proposes to emergency gather and remove wild horses and burros in the Twin Peaks and Buckhorn HMAs as shown in Table 2.1.7 below to prevent the horses and burros from succumbing to starvation, detrimental loss of body condition, and/or injury and disease, and to prevent damage to native rangelands, planned seedings, and priority sage-grouse habitat. The 38 mules would not be removed from the HMA under the emergency gather.

Table 2.1.7 Emergency Gather of Wild Horses and Burros within the Twin Peaks and Buckhorn HMAs

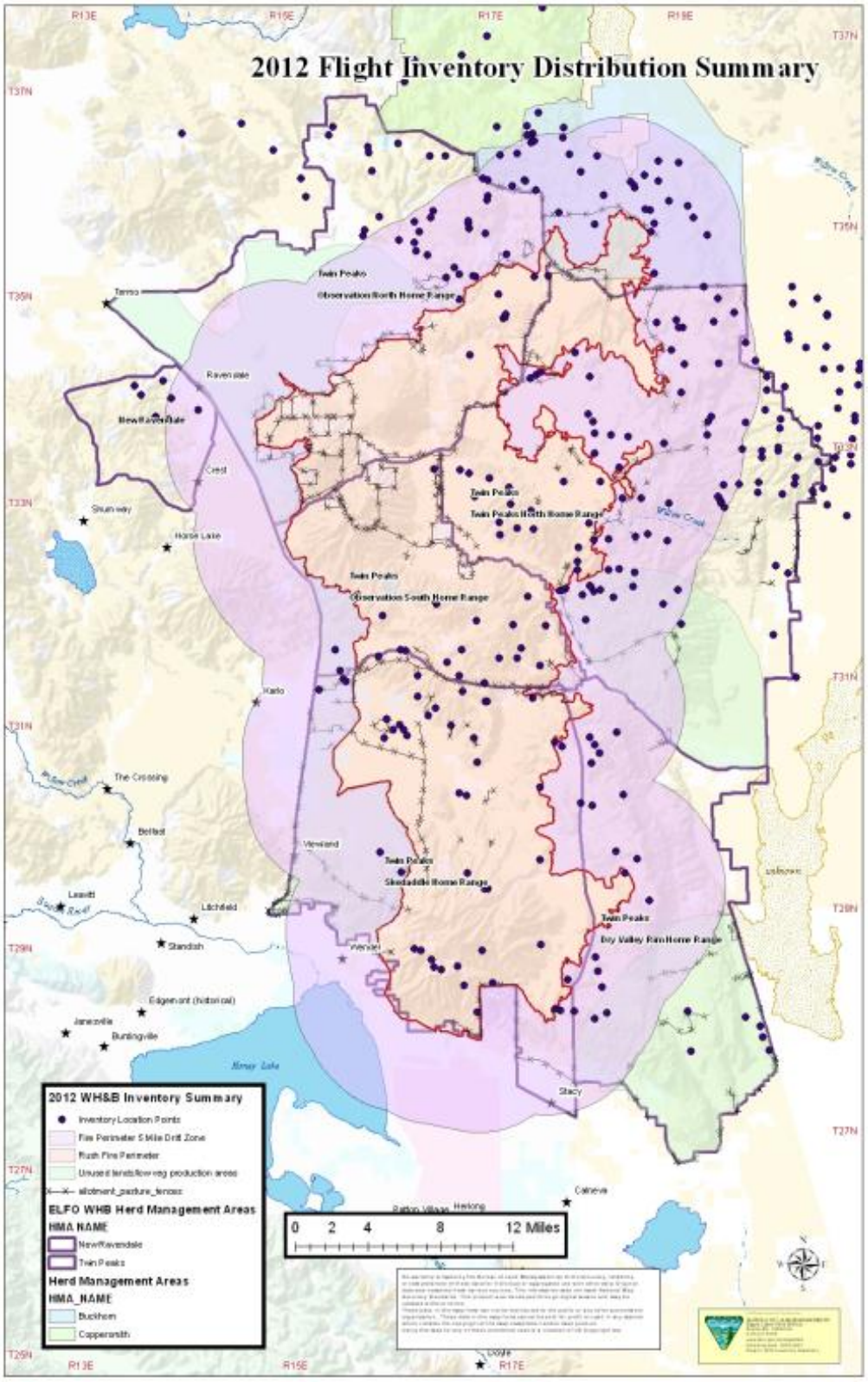
HMA	2012 Direct Count		Planned No. to Gather (90% Efficiency – Horses)		Planned No. to Release		Planned No. to Remove		Planned No. Remaining in HMA	
	Horses	Burros	Horses	Burros	Horses	Burros	Horses	Burros	Horses	Burros
Twin Peaks	983	275	885	N/A	222	0	663	203	320	72
Buckhorn	138	0	124	N/A	0	N/A	79	N/A	59	0
Total	1,121	275	1,009	203	222	0	728	203	379	72

The BLM plans to remove 728 wild horses and 203 burros from the Twin Peaks and Buckhorn HMAs as an emergency gather, due to lack of forage and water resources. All of the horses to be removed currently are located within the burned area or within a 5-mile buffer of the fire perimeter (see Map 4). 80% of the burros to be removed are located within the burned area, and the others to be removed are located in areas of the Twin Peaks HMA that are severely depleted of forage and water due to severe drought. The actual numbers of horses and burros captured may vary from the objective, due to the location and behavior of the animals during the gather period.

The BLM plans to leave 320 wild horses and 72 burros within the Twin Peaks HMA to guarantee that sustainable populations are able to thrive within the unburned areas. The BLM will leave 59 horses in the Buckhorn HMA, which is at the low appropriate management level for that HMA.

Due to the extreme effects of the wildfire and drought on wild horses and burros, this emergency gather is considered an immediate need, with the ideal timing for the gather operations being in the winter of 2012 to 2013. If this cannot be accomplished, the gather could take place in the summer, fall or winter of 2013.

Map 4. Location and Distribution of Wild Horses and Burros



In addition to the animal health reasons listed above, the purpose of the gather and removal of wild horses and burros is to allow native plants to recover from fire effects, as listed below:

1. Allow natural recovery of plants that will recover on their own to occur (from regrowth or sprouting), without the added pressure and stress of defoliation from grazing.
2. Allow the germination and initial growth of seeded plants to occur without ground disturbance from wild horse and burro hoof action and trailing.
3. Allow seeded plants to establish for at least two years so they are adequately rooted in the soil, to avoid them from being physically pulled out of the soil from grazing.
4. Allow seeded plants to grow into mature plants with sufficient leaf growth for photosynthesis and the ability to produce seed before they are grazed.
5. Allow riparian areas and wetlands, which are highly preferred grazing areas, to rest from wild horse and burro grazing pressure to allow for full recovery of riparian plant growth and vigor to ensure the proper functioning of riparian/wetland sites.
6. Allow native plants to recover from wildfire through regrowth and sprouting to provide food, cover, and shelter to wildlife, especially in mule deer, pronghorn, and greater sage-grouse habitats.

The gather would take place using a helicopter drive method of capture, with occasional helicopter assisted roping from horseback. The horses and burros would be gathered at a slow pace, with animals moving at a walk or slow trot. The animals would be gathered into capture sites constructed of portable panels, and kept at these sites for up to one hour, before being transported to temporary holding facilities. Up to 100 animals at a time would be kept at a capture site for a short duration.

The BLM would conduct a comprehensive post-gather aerial population inventory to determine the number of horses and burros remaining within the HMAs.

2.1.8 LIVESTOCK GRAZING CLOSURES

Livestock grazing would be removed from the burned areas in nine livestock grazing allotments in order to allow the burned and seeded vegetation to successfully re-establish. The closure would occur for a minimum of two growing seasons or until establishment objectives are met, in order to provide an adequate amount of time to allow the seeded vegetation to establish and native species to respond to natural revegetation. The following is a summary of the allotments affected for full or partial closures as a result of the fire.

Twin Peaks: Thirty-five percent of the allotment burned affecting two authorized grazing permits. The northeast portion of the allotment will remain open for grazing pending the installation of a temporary pasture division fence proposed in this plan.

Winter Range CA: Ninety-two percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Deep Cut: Forty-one percent of the allotment burned affecting two authorized grazing permits. The South Pasture was not affected by the fire and will remain open to grazing

according to management guidelines set forth in the Deep Cut Allotment Management Plan (AMP) and current Terms and Conditions of the permits. Livestock will be excluded from the middle and north pastures.

Observation: Fifty percent of the allotment burned affecting four authorized grazing permits. Livestock will be excluded from the Observation South and Middle Pastures. The Observation North Pasture was only partially affected by the fire and will remain open to grazing according to management guidelines set forth in the Observation AMP and current Terms and Conditions of the permits.

Shinn Peak IND: One-hundred percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Spanish Spring AMP: Ninety-nine percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Spanish Spring IND: Ninety-seven percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Twin Buttes: Sixty-five percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Tuledad: Five percent of the allotment burned affecting seven authorized grazing permits. Livestock will continue to be authorized on the allotment pending the construction of a temporary pasture division fence. Livestock will be excluded from the burned portion of the allotment.

Post-fire grazing management, including the period of time needed for closure, would be determined based on coordination, cooperation, and consultation with the interested public, monitoring, and achievement of site specific resource objectives. The Emergency Stabilization and Rehabilitation Plans for the Rush Fire state that resumption of livestock grazing could occur when the following objectives have been met for uplands and in transition zones between riparian/wetland sites in uplands:

1) **51% or more of native perennial grasses are producing seed**. Methodology: A seed head count is conducted on key grass species with a minimum of 50 points along a transect. The seed head counts will be conducted after the growing season to accurately represent whether desired native perennial grasses are producing seed heads.

2) **Total canopy cover is sufficient to provide for soil stabilization and site functionality. Greater than 70% canopy cover is present for the rangeland ecological site when compared to a control area that is in a similar unburned ecological condition.** Methodology: A Line Point Intercept (Cover) transect is conducted within the monitoring site, with a minimum total of 50 points. The procedure is designed to estimate the cover of plant species within the site. The transect measures the cover of plant species (perennial and annual), along with the percent cover of bare ground, rock, biological crust, and litter (standing and ground).

3) **For areas seeded with a grass mixture there will be a minimum density of three perennial grass plants per meter^2.** Methodology: One-half meter square density plots are used to read plant density at ten plots along each transect for a total of thirty plots.

This is then extrapolated to provide the plant density by species per square meter, which is an indicator of seeding success and recovery.

4) **Root systems of seeded grasses are sufficient to provide soil stabilization and are capable of withstanding livestock grazing. 90% of seeded grasses must have developed root and shoot systems extensive enough to prevent plants from being physically "pulled" from the ground by livestock grazing.** Methodology: Within seeded areas, grass pulls are conducted on seeded perennial grass species with a minimum of 50 pulls per key seeded species.

2.1.9 TEMPORARY TRAVEL RESTRICTIONS IN WILDERNESS STUDY AREAS

Several areas within WSAs that were previously non-accessible to motor vehicles due to the presence of thick vegetation are now easily traversable due to the heavy damage from the Rush Fire. The risk of unauthorized cross-country travel by motorized vehicles in WSAs is now considered very high, and is expected to result in increased soil erosion and damage to native plant communities trying to recover from the fire.

The BLM would implement a temporary travel restriction on 76 designated routes within six WSAs in order to prevent erosion and sedimentation within the burned area. These routes are shown on Map 5.

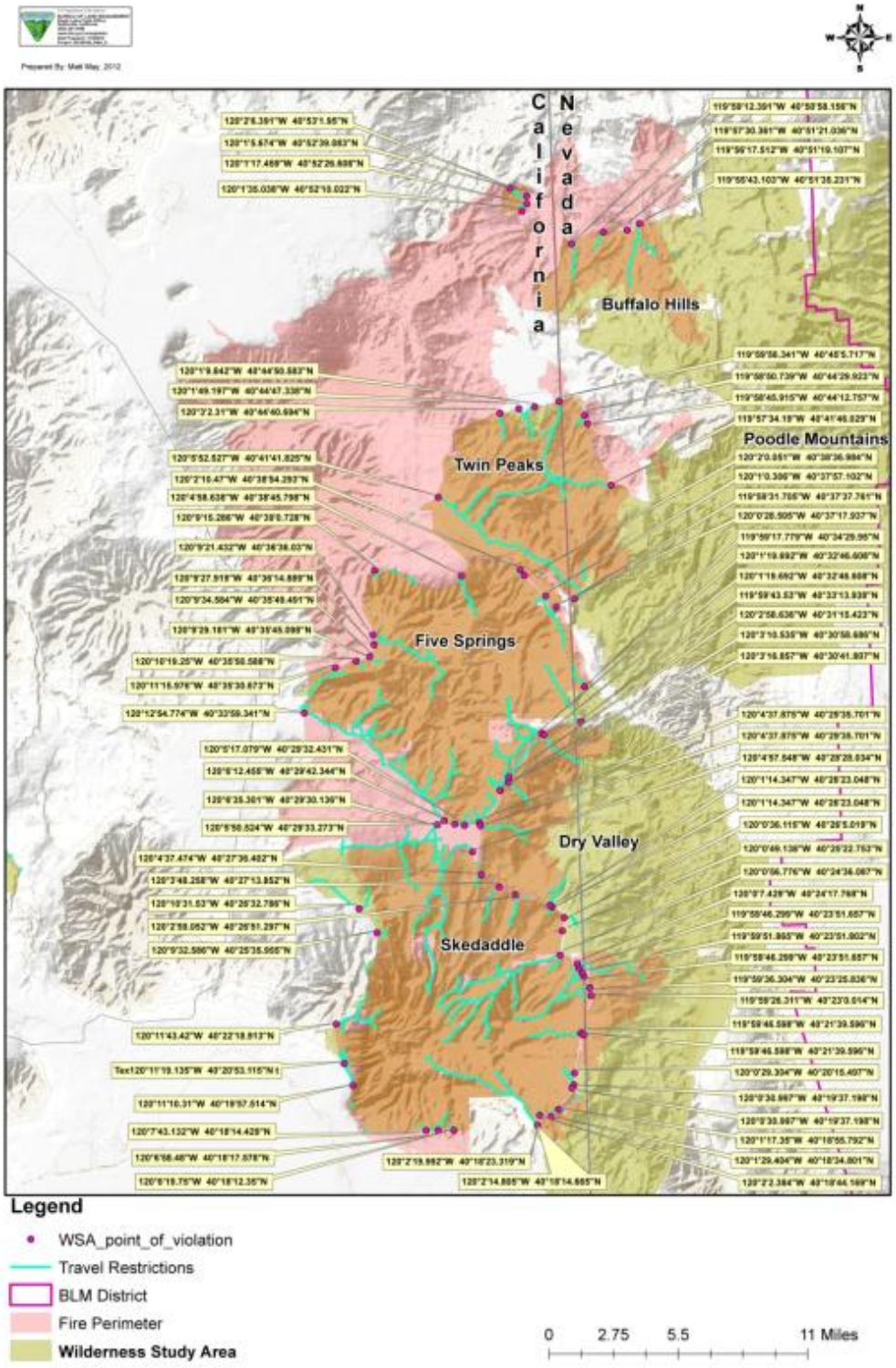
The seasonal implementation, duration and enforcement of the closures will be determined based on 1) the nature and frequency of recreational use; 2) weather conditions, and 3) stabilization goals. Uncontrolled cross-country motor vehicle travel will be prevented by the temporary closure. Wilderness character within the WSA will be upheld by promoting the successful implementation of emergency stabilization and rehabilitation treatments.

Motor vehicle access and OHV recreation will be temporarily restricted on the cherry stem vehicle routes, as well as on two-tracks within the effected WSAs. Closures will be accomplished in the first year through public outreach, through informational signs detailing the closure dates, and by installing Carsonite warning signs at strategic route access locations. In order to ensure physical closure features (i.e. signs, gates, temporary fencing, etc.) are effective and in good repair, compliance patrol and monitoring will occur.

All emergency stabilization treatments in WSAs will be implemented according to BLM Manual 6330 *Management of BLM Wilderness Study Areas*, the *Eagle Lake Resource Management Plan*, and BLM Handbook H-1742-1 *Burned Area Emergency Stabilization and Rehabilitation.*

A decision to continue the seasonal closures beyond the first year would be the responsibility of the BLM, and would be determined by monitoring and stabilization goals. Additionally, the BLM would determine if any modifications are necessary for the successful implementation of closure after the first year.

Map 5. Temporary Travel Restrictions in Wilderness Study Areas



2.1.10 FACILITIES – REPAIR/REPLACE SIGNS

The BLM would replace 14 recreation signs and posts damaged by the Rush Fire. Local fire crews and/or recreation staff would remove the damaged signs and posts. New posts and signs would be installed in the same location as they are presently in. Hand tools would be used for the majority of work; however, a gas powered post-hole auger will be used where needed. Construction would take place in late spring or early summer of 2013. The following signs would be replaced:

Sign Number	Location	Legal Description
CN-3	Horn Rd.	T34N R16E Sec 9 NW NW
CN-4	Shearing Corrals	T34N R16E Sec 25 SE NE
CN-8	Buckhorn Rd.	T35N R17E Sec 25 SW NE
CN-9	Buckhorn Rd.	T35N R17E Sec 25 SW NE
CN-10	Smoke Cr. Rd.	T30N R15E Sec 13 SE NW
CN-11	Brubeck Sp.	T30N R16E Sec 34 NE SW
CN-13	Bull Flat	T30N R16E Sec 34 NE SW
CN-14	Skedaddle Ranch Rd.	T29N R17E Sec 1 NW NW
CN-17	Smoke Cr. Rd.	T31N R17E Sec 14 NE SW
CN-18	Smoke Cr. Rd.	T30N R17E Sec 6 NW NE
CN-19	Bull Flat	T30N R17E Sec 4 SW NW
CN-22	Post Camp Rd.	T33N R16E Sec 10 NW SE
CN-27	Post Camp Rd.	T33N R16E Sec 10 NE SW
CN-35	Horn Rd.	T34N R16E Sec 14 NE NE

2.1.11 CLEANOUT OF RESERVOIRS AND PITS

The BLM would remove excess sediment and debris from 100 water catchments that resulted from increased watershed flow from the burned areas of the Rush Fire. The BLM would monitor the condition of 100 water catchments within the Rush Fire perimeter for the next three years. Heavy equipment would be used to remove excess sediment and debris from the reservoirs. The schedule is planned for thirty-three reservoirs to be cleaned out each year for the next three years. The inflow and outflow at each site would also be assessed for any damages caused by post-fire precipitation runoff. The BLM Force Account crews or a contractor would use dozers or backhoes to remove excess soil and debris from water tanks including the inflow and outflows.

2.1.12 WILDLIFE GUZZLERS

The BLM would inventory and remove/replace approximately ten wildlife guzzlers that were damaged by the Rush Fire. Damages or changes to guzzlers or their components due to the fire have rendered them non-functional. Removal of non-functioning guzzlers, aprons, and fencing followed by replacement with new guzzlers will allow for continued provision of

water to wildlife and will ensure maximum efficiency of water collection and holding. Subsequent monitoring and maintenance of each guzzler site would result in increasing the longevity of each guzzler.

New guzzler tanks, aprons, and protective fencing would be installed as needed. In addition, the BLM would construct protective ¼ -acre fencing around aprons at seven of the guzzler sites. Four of the guzzler sites have limited access and will need to be flown in; the other sites can be accessed by road.
The current guzzler tanks are made of 900-gallon capacity fiberglass, and would be replaced with 1,800-gallon, high density, cross-linked-polyethylene tanks. Pre-fire collection aprons were made of butyl rubber, concrete or metal, and would be replaced with a 40mm thick or better textured, high-density polyethylene liner. Tanks and aprons would be removed and installed using heavy equipment or by hand. The condition of protective fencing around seven of the ten sites varies, but new fencing at these seven sites would consist primarily of ¼ -acre fencing around aprons.

Nine of the 10 guzzlers are in BLM Wilderness Study Areas (WSA); five of these were installed in 1976 or before.

2.1.13 MONITORING

The Rush Fire ES&R plans propose monitoring all treatments for three years following treatment (2013-2015) to ascertain success of re-vegetation and other efforts. Monitoring transects would be established within all seeded areas and within areas managed for natural regeneration in each plant association type reseeded. Final site selections would be made by a BLM resource specialist. Site selection includes stratification of areas based on rangeland ecological sites, slope, soils, aspect, treatments (including seeding methods, seed mixes, and natural regeneration), allotments, etc. This stratification would occur primarily during the first year. The following monitoring protocols would be implemented.

Drill Seeding

Implementation monitoring would be accomplished by keeping records on each individual seeding. Photos will be taken directly after seeding is completed. Additionally, a GPS polygon will be created based on actual work accomplished.

Effectiveness monitoring will consist of selecting 20 randomized plots within each monitoring site. A 1 meter by 1 meter density square will be placed on these spots and species will be counted. Photo points will be included at each plot. At the end of the second and third growing seasons the measure of success will be the presence of 3 seeded perennial grass plants per M^2 and .5 sagebrush plants per M^2.

Vegetation monitoring methods will include density plots for seeded areas and photo points. The selected methodology is based upon the following protocol: Wirth, T.A., Pyke, D.A., 2007, Monitoring Post-fire Vegetation Rehabilitation Projects-A Common Approach for Non-forested Ecosystems: U.S. Geological Survey Scientific Investigations Report 2006-5048.

Aerial Seeding

Implementation monitoring would be accomplished by setting up 20 ground plots throughout the seeding area to measure actual seed dispersal.

Effectiveness monitoring will consist of selecting 20 randomized plots within each monitoring site. A 1 meter by 1 meter density square will be placed on these spots and species will be counted. Photo points will be included at each plot. At the end of the second and third growing seasons the measure of success will be the presence of 3 seeded perennial grass plants per M² and .5 sagebrush plants per M². Monitoring sites will be randomly selected within ten different ecological sites, at a rate of approximately one site for every 1,100 acres seeded. There will be a total of 24 monitoring sites within the seeded areas, and 11 monitoring control plots within similar ecological sites that have not been seeded, for a total of 35 monitoring sites.

Vegetation monitoring methods will include density plots for seeded areas and photo points. The selected methodology is based upon the following protocol: Wirth, T.A., Pyke, D.A., 2007, Monitoring Post-fire Vegetation Rehabilitation Projects-A Common Approach for Non-forested Ecosystems: U.S. Geological Survey Scientific Investigations Report 2006-5048.

Hand Planting

Implementation monitoring would be accomplished by recording the seedling planting activities overseen by BLM staff. Each species will be planted at the appropriate depth and spacing.

Observation and Skedaddle Mountains: In the spring of 2013 monitoring sites will be randomly selected. Monitoring will begin by taking baseline data prior to any ground disturbing planting. Rebar posts will mark each end of each transect. A 100-meter tape will connect each post and data will be collected by walking along the tape. At designated intervals the number of live and dead species will be recorded. Live species occurring along transects will be measured for height and leader growth. Monitoring will continue for three growing seasons. Success will be measured if 30 percent of the planted seedlings survive.

Stony Creek and Smoke Creek: Monitoring will consist of selecting 20 randomized 1 M² plots within each riparian area. In the fall of 2012 baseline data will be collected prior to any ground disturbing planting. A 1 meter by 1 meter density square will be used at each point to detect species density. A series of photo points will be included at each transect to measure willow establishment. At the end of the second growing season the measure of success will be the presence of 3 seeded perennial grass plants per M² and an increase of 20percent willow establishment.

Livestock Grazing Closures

BLM personnel will conduct livestock compliance inspections throughout the grazing season for the nine grazing allotments. All compliance inspections will be documented in the allotment files and Rangeland Administration System.

The Emergency Stabilization and Rehabilitation Plans for the Rush Fire state that resumption of livestock grazing could occur when the following objectives have been met for uplands and in transition zones between riparian/wetland sites in uplands:

1) **51% or more of native perennial grasses are producing seed**.
Methodology: A seed head count is conducted on key grass species with a minimum of 50 points along a transect. The seed head counts will be conducted after the growing season to accurately represent whether desired native perennial grasses are producing seed heads.

2) **Total canopy cover is sufficient to provide for soil stabilization and site functionality. Greater than 70% canopy cover is present for the rangeland ecological site when compared to a control area that is in a similar unburned ecological condition.**
Methodology: A Line Point Intercept (Cover) transect is conducted within the monitoring site, with a minimum total of 50 points. The procedure is designed to estimate the cover of plant species within the site. The transect measures the cover of plant species (perennial and annual), along with the percent cover of bare ground, rock, biological crust, and litter (standing and ground).

3) **For areas seeded with a grass mixture there will be a minimum density of three perennial grass plants per meter$^{2.}$**
Methodology: One-half meter square density plots are used to read plant density at ten plots along each transect for a total of thirty plots. This is then extrapolated to provide the plant density by species per square meter, which is an indicator of seeding success and recovery.

4) **Root systems of seeded grasses are sufficient to provide soil stabilization and are capable of withstanding livestock grazing. 90% of seeded grasses must have developed root and shoot systems extensive enough to prevent plants from being physically "pulled" from the ground by livestock grazing.**
Methodology: Within seeded areas, grass pulls are conducted on seeded perennial grass species with a minimum of 50 pulls per key seeded species.

A minimum of one monitoring site will be read in each pasture (or allotment) for every 1,000 acres, up to 10,000 acres in size, with an additional one monitoring site per 5,000 acres for larger pastures. A minimum of 157 sites will be monitored within these 14 allotments/ pastures.

Allotment/Pasture	No. of Sites Monitored	Burned Area (Acres)
Twin Peaks North	22	57,573
Twin Peaks South	27	85,960
Observation 1	19	45,406
Observation 2	10	9,818
Observation 3	21	56,011
Deep Cut 1	10	12,748
Deep Cut 2	2	1,226
Deep Cut 3	10	12,245
Winter Range CA	10	10,188
Spanish Spring IND	2	1,777
Spanish Spring AMP	8	7,556
Twin Buttes	2	1,217
Shinn Peak IND	4	4,394
Tuledad	8	7,842

Vegetation monitoring sites will include sites that have previously been analyzed and recorded under the BLM Eagle Lake Field Office Land Health Assessment Protocol. Other monitoring sites will be selected randomly within pastures in areas that are typically grazed by livestock, i.e. sites less than 30% slope, sites within one mile from a water source, and sites that do not contain very or extremely stony or cobbly soil surface textures. Additional sites may be monitored through the Great Basin Institute.

Each monitoring site will have a control plot for comparison evaluated within an unburned area of the same ecological site. Approximately 75 control plots will be monitored.

Vegetation monitoring methods will include density plots for seeded areas, line-intercept canopy cover transects, and photo points. The selected methodology is based upon the following protocol: Wirth, T.A., Pyke, D.A., 2007, Monitoring Post-fire Vegetation Rehabilitation Projects-A Common Approach for Non-forested Ecosystems: U.S. Geological Survey Scientific Investigations Report 2006-5048.

Travel Restrictions

Compliance patrol and monitoring will occur. A successful closure program will:

- Promote soil stability by allowing for undisturbed reestablishment of vegetative structure
- Ensure no new unauthorized intrusions are developed
- Retain WSA characteristics and visual resources.

Monitoring for the effectiveness of closure will measure:

- Quantifiable vegetative cover and composition data, using standardized measurement protocol, recognized and accepted by the BLM.
- Visitor compliance of closure regulations, ensuring no new vehicle intrusions are established due to openness of the fire disturbed terrain.

The monitoring goal for quantifying vegetative data will be set at 70% pre-fire vegetative cover. The percentage will be based on Ecological Site Descriptions of the pre- fire environment. Depending on the assessment of additional resource risks, meeting this vegetative stabilization goal may not be sufficient to lift travel restrictions in the area(s).

A complete removal of travel restrictions will also require that compliance measures have been effective and that motorized intrusions are not being established post-fire.

2.2 Alternative B. (No Action): Do Not Implement Emergency Stabilization and Rehabilitation Treatments

Under the No Action Alternative, the BLM would not implement the proposed treatments in the Emergency Stabilization and Rehabilitation Plans. All natural resources would be left to the process of natural rehabilitation. Fences and recreation facilities would not be rebuilt. Livestock closures would not be implemented, and the emergency gather for wild horses and burros would not take place.

3.0 AFFECTED ENVIRONMENT

3.1 Area of Critical Environmental Concern (ACEC)

There are four Areas of Critical Environmental Concern (ACECs) within the Rush Fire perimeter, as listed in Table 3.1 below. In order to meet the criteria to be designated as an ACEC, an area must contain significant historical, cultural, scenic, wildlife habitat, or other natural values. Furthermore, the site's importance must extend beyond the local level. A description of each ACEC and its unique resources, management concerns, and the amount affected by the Rush Fire are described below.

Table 3.1 Areas of Critical Environmental Concern in the Rush Fire Perimeter

Area of Critical Environmental Concern	Size (acres)	Size of Burned Area (Acres/Percent of ACEC)
Buffalo Creek Canyons ACEC	36,515	124 acres/.0.3%
Pine Dunes Research Natural Area /ACEC	2,887	108 acres/4%
North Dry Valley ACEC	10,156	Not burned
Lower Smoke Creek ACEC	894	Not burned

Buffalo Creek Canyons ACEC

The Buffalo Creek Canyons ACEC contains 36,515 acres of BLM-administered land. The Rush Fire burned only 124 acres within the ACEC boundary, which is less than 1%. This ACEC has been designated to protect cultural, historic, and scenic values and the undeveloped setting of the Buffalo Hills Toll Road. The Buffalo Creek ACEC is a large remote area that is permitted for livestock grazing each year. Presently, the area receives rest and/or deferment from livestock grazing during each grazing season. Present management is focused on reducing impacts from livestock in the deep canyons where livestock seek water and forage.

Most of the uplands within the ACEC currently meet land health standards. There are some areas, however, where invasive plants (cheatgrass and medusahead) are present to the extent that they limit or prevent natural recovery of native species. The riparian areas in the ACEC have been assessed and have been found to vary in condition from "Properly Functioning" to "Functioning at Risk" with a static to downward trend. Areas rated in the ACEC as "Functioning at Risk" are generally associated with year-long wild horse use.

North Dry Valley ACEC

The North Dry Valley ACEC is approximately 10,156 acres. The Rush Fire did not burn within the ACEC boundary. This ACEC was designated to protect cultural, biological, and geological values, fish and wildlife resources, and scenic values. There are numerous and varied cultural sites associated with prehistoric lakeshore hunting and habitation areas, as well as quarry sites and caves that are unique to the region. There are also historic gravesites and homestead

remnants. A special riparian area exists at Laird Spring that is important to wildlife and significant as an archaeological site. There are unique soils in the ACEC associated with the winterfat shrub (*Krascheninnikovia lanata)*.

Approximately 40 to 60% of the ACEC contains invasive annual plants (primarily cheatgrass) which have reduced the overall land health of the area. Repeated wildfire and unregulated yearlong historic (pre-1970) livestock use and trespass influenced the spread of invasive annuals. Wild horses use this area extensively in the winter, spring, and early summer months, depending on the availability of watering sites.

Lower Smoke Creek ACEC

The Lower Smoke Creek ACEC contains 894 acres along 3.2 miles of Lower Smoke Creek, and was designated to protect cultural and historic, biological and geological values, fish and wildlife resources, and scenic values. The Rush Fire did not burn within the ACEC boundary. The BLM has improved riparian conditions along Lower Smoke Creek by implementing fencing and a livestock grazing strategy which limits livestock grazing to specific seasons of use, and to only some areas of the creek. Wild burros use this area fairly extensively year long. About 50% of Lower Smoke Creek is fenced off from the burros due to fences on private lands.

Pine Dunes Research Natural Area /ACEC

The Pine Dunes Research Natural Area (RNA)/ACEC (2,887 acres) was designated to protect a unique stand of Ponderosa Pine trees growing in a stabilized sand dune area. The Rush Fire burned only 108 acres within the ACEC boundary, which is less than 4%, and the fire did not affect any of the unique pine trees for which the ACEC was created to protect. Several other dune-dependent plant species grow in this unique area. Current management actions to protect the ACEC include exclosure fencing of 160 acres to keep livestock, wild horses, and off-highway vehicles out of the Pine Dunes area. If additional lands are acquired by the BLM adjacent to the dunes, these lands would also be fenced.

3.2 Cultural Resources

Culture History

Ethnographically, the fire occurred within the territory of the Hammawi (Achumawi), Aporige (Atsugewi), Northern Paiute (Wadakut, Tasiget, Paviotso, Kidutokado and Kammatakuta) people, Mountain Maidu, and Washoe. The Native Americans were hunting-gathering bands that generally traveled seasonal rounds in small family groups subsisting on a variety of plant foods, insects, game, and fish. Game animals available to Native Americans in the fire area included antelope, rabbits, bighorn sheep, mule deer, and a variety of small mammals, reptiles, and birds. Lahontan cutthroat trout were procured at nearby Summit Lake. Seeds and roots were the primary plant foods gathered.

Historically, the first Euro-American presence in this region was focused on passage along emigrant trails, specifically the Nobles Trail. Later land use has been largely dominated by cattle and sheep ranching, farming, with limited mining activity and military development. Historic archeological sites include emigrant trails, homesteads and refuse scatters.

Cultural resource inventories in the vicinity of the project area indicate that the area was used by prehistoric people for resource procurement activities and habitation areas. In addition, seasonal, temporary campsites were established for the purposes of procuring tool stone material, game, and plant resources. Historic resources are associated with livestock grazing activities and early homesteading.

Although few of the cultural resource sites have been formally evaluated for their eligibility to the National Register of Historic Places (NRHP), many of the sites appear to have elements which qualify them as eligible to the NRHP under criterion D (the site contains information that would contribute to our understanding of human history or prehistory). Because a formal determination of National Register eligibility has not been made for most of the sites, the Bureau of Land Management assumes that all sites are eligible. The Class I Cultural Resources Overview and Research Design for the Alturas, Eagle Lake, and Surprise Resource Areas (King et al. 2004) presents a detailed background of regional prehistoric and historic research, research issues, and a site sensitivity model for the fire vicinity.

Cultural Resources

There is a great diversity of cultural resource categories and associated types that are known, or expected to exist across the landscape affected by the Rush Fire. These categories and types include: rock art, cave sites, lithic scatters, historic scatters, and historic trails, see Table 3.2 for a more complete list of site types found within the fire.

Table 3.2 Cultural Resources Sites by Vulnerability to fire

Site Type	Vulnerability to Fire	Count
High Vulnerability		
AH4	High	8
AP02 - Lithic scatter; AP05 - Petroglyphs	High	4
AP02 - Lithic scatter; AP05 - Petroglyphs; AP08 - Cairns/rock features	High	3
AP02 - Lithic scatter; AP05 - Petroglyphs; AP08 - Cairns/rock features; AP15 - Habitation debris; AP16 - Other (prehistoric)	High	2
AP02 - Lithic scatter; AP15	High	2
AP05 - Petroglyphs	High	149
AP05 - Petroglyphs; AP08 - Cairns/rock features	High	7
AP05 - Petroglyphs; AP14 - Rock shelter/cave	High	2
AP08 - Cairns/rock features	High	8
AP02 - Lithic scatter; AP04 - Bedrock milling feature; AP05 - Petroglyphs	High	4
High Vulnerability Total		**189**
Medium Vulnerability		
AH04 - Privies/dumps/trash scatters; AP02 - Lithic scatter; AP04 - Bedrock milling feature	Medium	3
AH06 - Water conveyance system; HP20 - Canal/aqueduct	Medium	2
AP02 - Lithic scatter; AP04 - Bedrock milling feature; AP14 - Rock shelter/cave	Medium	7

Site Type	Vulnerability to Fire	Count
AP02 - Lithic scatter; AP08 - Cairns/rock features	Medium	2
AP02 - Lithic scatter; AP08 - Cairns/rock features; AP15 - Habitation debris	Medium	1
AP02 - Lithic scatter; AP14 - Rock shelter/cave	Medium	3
Medium Vulnerability Total		**18**
Low Vulnerability		
AH-1 -Historic	Low	25
AH-1; HP1	Low	106
AH04 Railroad/trails, AP15 - Standing Structure	Low	1
AP02 - Lithic scatter	Low	116
AP02 - Lithic scatter; AP04 - Bedrock milling feature	Low	64
AP02 - Lithic scatter; AP04 - Bedrock milling feature; AP08 - Cairns/rock	Low	2
AP02 - Lithic scatter; AP04 - Bedrock milling feature; AP12 - Quarry	Low	4
AP05;HP1	Low	1
AP15 Standing Structures	Low	11
HP33-Farm/Ranch	Low	1
Low Vulnerability Total		**331**
Grand Total		**538**

Findings – Eagle Lake Field Office

Smoke Creek

A focused assessment documenting the condition of petroglyph panels, as well as other cultural components, relative to the effects of fire and potential post-fire erosional effects, looting, and other risks was conducted within the National Register of Historic Places (NRHP) listed Smoke Creek Canyon Petroglyphs National Register District and surrounding Bruff's Rock, a NRHP listed site. The specific areas assessed include both the east and west sides of the canyon along the stretch in Section 31 of Township 33N, Range 17E, both the east and west sides of the canyon along the stretch beginning in Section 13 of Township 33N Range 16E and ending where the canyon enters private land in Section 12 of Township 33N, Range 16E, with a side-trip to Wagontire Spring, and a third stretch along the west side of the canyon only, from where Smoke Creek passes through the NW ¼ of Section 25 of Township 33N, Range 16 E and through Section 24 of Township 33N Range 16E.

While each of these segments differed to a degree in slope, relief and to a lesser extent, aspect; the findings were relatively consistent. First, the fire burned in a mosaic pattern throughout most of the canyon. Most of the riparian corridor along the canyon bottom was burned, while the low terrace that leads up to most of the petroglyph panels as well as the rim of the canyon above burned in a mosaic pattern consisting of areas of low burn severity with very small pockets of moderate severity where the shrub and overstory component were consumed. These areas were punctuated by stretches of the canyon and rim above that were unburned.

A total of one-hundred and nine (109) sites are known in the Smoke Creek Canyon. Thirty-six (36) sites out of the total within the district were assessed. Additionally, many previously unrecorded petroglyph panels were identified and assessed for fire related damage and risk from post-fire effects.

Fire effects on the petroglyphs were assessed to be none to minimal. Soot was observed, deposited on just a few panels throughout the assessment areas. Likewise, there were no fire effects to rock ring features along the canyon rim. Some lithic materials, where present, do show some evidence of heat alteration. Barring a precipitation event of great magnitude, none of the assessed petroglyph panels in Smoke Creek Canyon are at risk from scouring and erosion. They are located in association with basalt bedrock outcrops and boulders that form the canyon wall and rise above the high water line. The remainder of the known sites, and new sites in the same topographic setting, are equally secure.

There are, however, other post-fire risks to these resources. Four (4) sites, including the NRHP listed Bruff's Rock, are at risk from tree hazards. These sites are located above locations where the overstory component was either totally consumed or where the fire left standing junipers. Looting and vandalism activities present another significant post-fire effect that may place sensitive cultural resources values at risk. Anecdotal evidence suggests that such prohibited acts increase significantly after a fire event as the result of a denuded landscape that exposes both artifacts and features. One petroglyph panel on site 33.16.13.16 was noted to have been vandalized by the removal of an anthropomorphic panel element. Although this act was committed sometime before the fire, it documents that such activities have, and likely will continue to occur in the canyon. Of equal, if not greater concern, there was evidence of recent looting of site 33.16.13.01 that occurred during or immediately after the fire. A discard pile of lithic flakes and the base of a projectile point were noted on a site containing petroglyphs with a second locus on a bench above the canyon wall, and below the rim. The discard pile is located atop the burned soil amidst a dense lithic scatter and two stone circles, one of which contains groundstone artifacts.

While completing the assessment in the northernmost stretch of the focus area, a side-trip was made to identify issues associated with a proposed exclusion fence at Wagontire Spring. An assessment at this location revealed an area of moderate burn severity and resulted in the identification of a large linear lithic and groundstone scatter positioned along both sides of the spring and associated channel. Intensive cattle grazing in this area has compromised site integrity and unless livestock is excluded from this area until such time as the ground can heal, this problem is sure to be exacerbated by animal trampling and grazing.

Deep Creek

Low to moderate soil burn severity and a high density (58) of known archeological sites along the main channel of the Deep Creek drainage drove the decision to spot sample portions of the area. On September 10th and 13th, archeologists assessed the condition of a total of eleven (11) previously recorded sites along the Deep Creek canyon bottom and rim rock areas. Several previously unrecorded petroglyph panels and isolated elements were also found and assessed for fire effects.

During the first day of assessment work, a very large site (31.16.21.04) at the western edge of the fire was visited by the entire assessment crew. This site, at the confluence of Deep Creek and the Five Springs drainage, occupies a large, flat terrace characterized by sandy loam soils. The entire flat containing the site was burned over, consuming all vegetation and exposing the site surface in an area of approximately twenty acres. The site holds a variety of tools of both chipped and ground stone, made of several material types. The variety of tools and material types suggests repeated use of the site by different people over a long time span.

This site is significant. Site integrity was not seriously affected by the fire, but the loss of vegetation will predictably lead to a rapid loss of soil and exposure of more artifacts on the shifting ground surface. The soils on site require stabilizing by reestablishing vegetation through seeding and temporary protection of the seedbed.

During the remainder of the time spent examining the archeology of Deep Creek, no other site was found that was so affected. No other sites require any treatment in this drainage.

Two archeologists entered a side canyon of Deep Creek and assessed two sites. Site 31.16.27.03, a boulder glyph was relocated as previously recorded in drainage. There were no effects from fire and no threat from post-fire conditions was identified. Site 31.16.27.04 is a glyph on north facing rim rock south of 31.16.27.3. No effects from fire, or threats from post-fire conditions were identified at this site. While searching for the glyph, a small boulder shelter was found to the west of the glyph. The opening appears to have been reduced or enhanced by placing several rocks across the natural opening. This shelter could serve as an inconspicuous observation post, but no cultural material was found inside the shelter.

Parsnip Wash

A reconnaissance cultural resources assessment was conducted at Parsnip Wash. Owing to the long travel time and difficult access, this area was assessed primarily to substantiate burn severity and to estimate the probability of post-fire risks to the four recorded sites in the wash. Two archeologists entered a side canyon to Parsnip Wash off of an access road about 1 ½ miles downstream from its headwaters, and immediately above Sage Spring. One site, 33.18.24.01 is a large rock shelter with a prominent midden located under an east facing formation of pahoehoe lava, and just below an active mountain lion lair. This site is in very good condition and is not within the burn. However, the fire did burn around the north side of the shelter and down canyon to the confluence with the main stem of Parsnip Wash. Three additional sites, 33.19.17.01, 33.19.18.01, and 33.19.19.01 were not re-visited. These sites are located near the bottom of the wash and may have burned but based on observed burn severity, are not likely to be subject to post-fire effects.

Sage Hen Spring

Two archeologists assessed site 33.16.35.02 which is located at Sage Hen Spring near Smoke Creek. It is a moderate density lithic and groundstone scatter with 45 flakes m2 that experienced light and moderate burn intensity over the majority of the site. The site incurred no suppression impacts and no erosional threats were observed. There are no treatment recommendations.

Spencer Creek

One archeological site (29.17.33.02) was assessed in the Spencer Creek drainage. The site was provisionally determined to be ineligible for listing on the National Register. However, because the determination was not final, a rapid assessment was conducted. This scatter of lithic debitage along a tributary of Spencer Creek was burned over but was not adversely affected by the fire. There is no threat to the site from post-fire conditions in the drainage.

East Side Reservoir

A small lithic reduction site (29.17.36.01) was recorded near East Side Reservoir during an inventory of WSA intrusions. The previously documented reduction area was not relocated, however the general area of the site was found to be much larger than originally recorded. The larger area contains cobbles of good tool stone (chert, quartzite, and basalt) across a very large area on the ridge southeast of the reservoir. The entire ridge is a significant archeological site. The site was not adversely affected by the fire and will not be affected by post-fire conditions.

Horne Ranch Grave Area

The grave site (RushSup-2) was burned over, but it is in a level area and will not be affected by erosion caused by the post-fire conditions.

Painter Creek Exclosure

This large site (34.16.11.00 and 34.16.14.00) southwest of the Horne Ranch was burned over. Several trees are down on the site, but there is no danger to the site from post-fire conditions. The two sites were found to be one continuous lithic scatter and as a result of the new exposures, these sites are now considered to be one large site.

Mixie Flat Area

Horse Corral Spring was burned over and the historic Marr corral was burned. Archeological materials are exposed on the surface but the area is generally flat and will not be affected by post-fire conditions. Any proposal for ground disturbing activity in proximity to the spring or the old corral must be considered with regard for the archeological deposits. Horse Corral Spring (East) did not burn and will not be affected by post-fire conditions.

Indian Spring is a very large, multicomponent site that experienced a low to moderate burn. The previously documented site area has been revised to reflect post-fire observations. At this time the site boundaries are based on the exposure and may actually represent only a portion of the cultural manifestation at this location. Artifacts are now exposed on the ground surface and the newly exposed site area should be documented prior to treatment. The site would be affected by any significant precipitation event. A treatment specification has been designed to mitigate the post-fire conditions.

Nobles Trail

This historic trail enters the fire approximately seven miles northeast east of where it crosses U.S. Highway 395. Time constraints limited the cultural assessment to a drive by reconnaissance with a brief visit to two site locations. Site 31.17.28.01 is a multi-component site

consisting of a historic trash scatter dating from the 1930s to the 1950s, and a prehistoric lithic scatter. It is located within the burned area, but was not significantly affected and does not appear to be at risk from post-fire effects. Site 31.17.14.01 (CA-LAS-190) is a large lithic and groundstone scatter, with a historic component that may be a sheepherder's camp, that was partially burned over. The fire affected portion of this site is located on the toe of a moderately steep slope and may be at risk from post fire effects. A more comprehensive assessment needs to be made of the entire trail within the burn area to determine if treatments are appropriate at this site, the trail itself, or other sites along the trail corridor.

Tommy Tucker Cave and the Kiln Site

Two sites along Wendel Road were assessed, the Tommy Tucker Cave, CA-LAS-001 and 28.16.04.04, the Kiln site. At the Tommy Tucker Cave a user created road and trail to Tommy Tucker Cave was partially obscured by vegetation prior to the fire. Following the fire the road and trail provide a stark contrast to the burned vegetation and could create increased visitation to the site. A treatment specification to block the road, re-vegetate and sign the area has been designed to mitigate the post-fire conditions.

The Kiln site (28.16.04.04) was within the burned area and will likely receive increased amounts of runoff from rain and snowmelt events, causing erosion and sedimentation within the road which bisects the site. A treatment specification to redirect the water away from sensitive archeological areas has been designed to mitigate the post-fire conditions.

Pilgrim Lake

The Surprise archeologists assessed site 35.17.25.01 which consists of a light to moderate lithic scatter on the west shoreline of Pilgrim Lake. The site consists of 200 to 300 obsidian and chert flakes. The site was partially burned at a moderate burn severity and incurred no suppression impacts. Fire effects observed at the site consist of crackling/spalling and smoke/soot damage. Due to the absence of duff on the site erosional effects from wind are possible. There are no treatment recommendations.

A newly discovered site at Pilgrim Lake is a dry stacked stone structure with limited trash scatters in association as well as two stock tanks. The site was burned over at a high burn severity and incurred no suppression impacts. Fire effects observed at the site consist of stump/root holes, a possible loss of architectural wood/features, and vegetation burn out of the interior of the structure. No erosional threats were observed. There are no treatment recommendations.

Findings – Surprise Field Office

Eleven sites identified within the burn on lands managed by the Surprise Field Office were assessed by the Surprise Archeologists. These sites include six (6) sparse or moderately dense lithic scatters (SLS), three (3) dense lithic scatters, one campsite with petroglyphs, and one very large lithic scatter with stone features. Of the SLSs, two were unburned and three were partially burned over. Two of the three partially burned over SLSs were subject to fire suppression impacts. All of the three dense lithic scatters were partially burned over, and two of the three were impacted by fire suppression activities. The campsite with petroglyphs was partially

burned over. None of these ten sites were impacted to any extent by the fire, and none of them are expected to be at risk from post-fire effects.

The eleventh site, 35.18.12.01, is a large, extremely dense lithic scatter containing 1500+ obsidian and other debitage as well as groundstone on a plateau rim, meadow, and lower slopes surrounding a spring above Garden Lake. A rock ring and stone circle features are located at the site. The site was partially burnt at a moderate burn severity and incurred tree falling during fire suppression efforts. The tree falling did not negatively impact the site integrity. Fire effects identified on site consist of smoke and soot damage. No erosional threats were observed. Directional falling is recommended for a juniper located in association with the identified rock features. This treatment is recommended as a damage prevention measure to the prehistoric feature where soil destabilization at the base of the juniper may eventually cause the tree to fall across the feature.

3.3 Soil, Hydrology, and Watershed Resources

The areas burned by the Rush Fire are characterized by mountains, plains and canyons that are comprised of steep to gentle rolling hillslopes with very stony surfaces. The dominant geographic features are Cherry Mountain, Five Spring Mountains, Observation Peak, Rush Creek Mountain, Shinn Mountain, Skedaddle Mountains, and Spanish Springs Peak. The fire ranged from 4,020 feet above mean sea level (MSL) along the southern toe of Skedaddle Mountain to 7,964 feet above MSL on top of Observation Peak. Major drainages affected by the fire include the Buffalo Creek, Deep Creek, Rush Creek, Secret Creek, Smoke Creek, Skedaddle Creek and Stony Creek.

The geomorphic region consists mainly of mountains and structural basins of the Great Basin. The mountains are igneous in nature and consist of various basaltic and andesitic parent material (USDA, NRCS,2004).

Soils

The NRCS soil survey was developed in an orderly pattern that is related to the geology, landforms, relief, climate and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. (USDA, NRCS, 2004).

There are 132 soil mapping units within the burn area. The majority of these units are associations, which means there is more than one soil type in the unit. The following is a brief mapping unit descriptions of the dominant general soil associations that occur within the Rush fire:

- **Rubble land – Longcreek – Firesprings - Devada Association, Very Rocky (41% of the fire):** Shallow well-drained very stony loams on 3 to 50% slopes. This association occurs in the mountains, mountain ridges and plateaus and is formed on basalt mountains and hills. Runoff is high to very high.
- **Wylo – Tunnison - Pickup - Devada Association, Stony (18% of the fire) :** Shallow

well-drained stony loams and cobbly loams 3-50% slopes. This association occurs on mountains and plateaus developed from basalt. Runoff is high to very high.

- **Seales – Petescreek – Fredonyer Association, Stony (16% of the fire):** Shallow to moderately deep, well-drained very stony loams and very stony sandy loams on 2-50% slopes. This association occurs on mountains, mountain ridges and plateaus weathered from basalt. Runoff is very high.

- **Tunnison – Horsecamp – Devada - Corral Association, Cobbly (14% of the fire):** Moderate to shallow, well-drained very stony clay, and cobbly silty clay on 2-30% slopes. This association occurs on plateaus derived from basalt. Runoff is high to very high.

- **Ninemile – Newlands – Homecamp, Rocky (11% of the fire):** Moderate and shallow well-drained very stony loams on 2 30% slopes. This association occurs along mountain ridges and plateaus weathered from basalt. Runoff is very high.

Climate

Lassen County, California has hot, dry summers and cool, wet winters. Susanville, California as a total precipitation of 14.43 inches, about 3 % usually falls in June through September. Thunder storms occur on about 14 days each year, and most occur in July. The heaviest 1-day rainfall during the period of record was 4.7 inches at Susanville Airport on October 13, 1962. The average seasonal snowfall is 24.2 inches. The greatest snow depth at any one time during the period of record was 38 inches, which occurred on February 14, 1938. The heaviest 1-day snowfall on record was 18 inches recorded on March 12, 1967. The sun shines 96 percent of the time in the summer and 76 percent of the time in the winter. The prevailing wind is from the west northwest (USDA, NRCS, 2004).

The majority of the burned area receives less precipitation than Susanville except on the higher elevations in the mountainous areas, where average annual precipitation can exceed 20 inches. A remote automated weather station was installed in 2000 at Bull Flat, near the center of the fire at an elevation of 4,395 feet above MSL. This station recorded an average annual precipitation of 6.6 inches over the previous 11 years. The highest annual precipitation, 11.4 inches, occurred during the 2006 water year. The driest water year on record was 2001, when only 3.8 inches of precipitation fell. The Bull Flat weather station recorded 4.5 inches of precipitation from the beginning of the 2012 water year (October 1, 2011) until the fire started. In the months of May through August, 2012, only 0.3 inches of precipitation was recorded.

Hydrology/Water Quality

The Rush fire burned into four sub-basins on the Hydrologic Unit Code HUC-8 level (Table 3.3.1). The sub-basins with the largest burned areas were Honey-Eagle Lake and Smoke Creek Desert. The burned area in the Madeline Plains Sub-basin was confined to the north most end of the fire and only a small portion of the Massacre Lake Sub-basin was burned in the in the north east corner of the fire.

Table 3.3.1 Hydrologic Areas at the Hydrologic Unit Code (HUC) 8 Level

Region	Subregion	Basin	Sub-basin	Huc_8
Great Basin Region	Black Rock Desert-Humboldt	Black Rock Desert	Smoke Creek Desert	16040203
Great Basin Region	Black Rock Desert-Humboldt	Black Rock Desert	Massacre Lake	16040204
California Region	North Lahontan	North Lahontan	Madeline Plains	18080002
California Region	North Lahontan	North Lahontan	Honey-Eagle Lakes	18080003

At the HUC-12 level, 26 watersheds were burned in the Rush Fire: Seven were in the Smoke Creek Desert Sub-basin, two in the Massacre Lake Sub-basin, six in the Madeline Plains Sub-basin, and eleven in the Honey-Eagle Lake Sub-basin.

The Honey-Eagle Lake Sub-basin in the area of Skedaddle Mountains had the highest percent slopes in the Rush Fire. At the HUC-12 level, the Wendel Canyon-Frontal Honey Lake watershed had the steepest slopes.

Reconnaissance Methodology

The purpose of a burned area assessment is to determine if the fire caused emergency watershed conditions and if there are potential values at risk from these conditions. Identification of values at risk occurs through consultation with the individuals, state and federal agencies and through field investigation. Not all values initially identified are determined to be at risk. If emergency watershed conditions are found and values at risk are identified and confirmed, then the magnitude and scope of the emergency is mapped and described, values at risk and resources to be protected are analyzed, and treatment prescriptions are developed to protect values at risk. The most significant factor leading to emergency watershed conditions is loss of ground cover, which leads to erosion and changes in hillslope hydrologic function in the form of decreased infiltration and increased runoff. Such conditions lead to increased flooding, sedimentation and deterioration of soil condition.

Burned area evaluations included:

- Identifying fire-caused changes in soil properties and hydrologic function;
- Determining spatial extent and strength of hydrophobic soil conditions;
- Determining post-fire infiltration rates;
- Verifying and modifying the Burned Area Reflectance Classification (BARC) image to create a soil burn severity map, and if appropriate a runoff potential map;
- Identifying sediment source areas and erosion potential;
- Determining current channel and culvert capacities;

- Identifying potential flood zones; and
- Identifying potential threats to human life, property, and critical natural and cultural resources (values at risk).

The Emergency Stabilization and Rehabilitation (ESR) Team of hydrologists and soil scientists conducted aerial reconnaissance flights and field visits to review resource conditions after the fire. The main objectives of the field visits were to 1) evaluate soil burn severity and watershed response in order to identify potential flood and erosion source areas as well as debris flow hazards; 2) identify and inventory values at risk; 3) identify the physical and biological mechanisms that are creating risks; 4) review channel morphology and riparian conditions; 5) inspect hillslope conditions; and 6) determine needs for emergency stabilization.

Values at risk are human life and property, and critical natural and cultural resources located within or downstream of the fire that may be subject to damage from flooding, ash, mud and debris deposition, and hillslope erosion.

Soil Burn Severity

Soil burn severity mapping is intended to reflect the degree of effects caused by the fire to soil characteristics that affect soil health and hydrologic function, hence erosion rate, and runoff potential. It is not a map of vegetation consumption. In mapping soil burn severity, the team evaluated field-observable parameters such as the amount and condition of surface litter and duff remaining, soil aggregate stability, amount and condition of fine and very fine roots remaining, and surface infiltration rate (water repellency). Water repellency was evaluated by observing the length of time a water drop remained beaded on the soil. If water repellency was present, the depth and thickness of this water repellant layer was also measured. Ash and soil color may also indicate how intense the heat was and how long it remained at a given place (residence time). These parameters are compared to similar soils under unburned conditions to estimate the degree of change caused by the fire. The Rush Fire perimeter and the Burned Area Reflectance Classification for the fire are shown on Map 1.

While soil burn severity is not based primarily on fire effects to vegetation, the team used post-fire vegetative condition as one of the visual indicators in assessing soil burn severity. In some cases there may be complete consumption of vegetation by fire, with little effect on soil properties, such as in a shrub ecosystem. Denser vegetation, with a deeper litter and duff layer, results in longer heat residence time, hence more severe effects on soil properties. For example, deep ash after a fire usually indicates a deeper litter and duff layer prior to the fire, which generally supports longer residence times. This promotes loss of soil organic cover and organic matter which are important for erosion resistance, and the formation or exacerbation of water repellent layers at or near the soil surface. The results are increased potential for runoff and soil particle detachment and transport by water, wind, and gravity. This would be mapped as high soil burn severity.

Conversely, sparse or light pre-fire vegetation such as grasses or sparse shrubs usually have negligible litter layer and surface fuels and experience extremely rapid consumption and spread rates, with very little heat residence time at the soil surface. The result is very little alteration of

soil organic matter and little or no change in soil structural stability. Water repellency, usually present under shrubs before the fire, may or may not be exacerbated by the fire. Areas between shrubs or grass crowns usually had very little fuel to burn, thus only experienced brief radiant heat as the flashy grasses and sparse shrubs burned. In these cases, soil burn severity would be low.

In between these extremes, the moderate class of soil burn severity is far more diverse in observed soil conditions and can include various vegetation types, ranging from forests to shrub communities. In the case of a forest, the litter layer may be largely consumed, but scorched needles and leaves remain in the canopy and will rapidly become mulch. This is important in re-establishing protective ground cover and soil organic matter. This factor can result in the classification of the area as moderate, rather than high. Generally, however, there will also be less destruction of soil organic matter, roots, and structure in an area mapped as moderate. In a shrub ecosystem, even where pre-fire canopy density was high, litter layer is generally thin, and while the shrub canopy may have been completely consumed by the fire, the soil structure, roots, and litter layer may remain intact beneath a thin ash layer.

Above ground indicators such as size of unconsumed twigs remaining to help the team determine how long the heat may have persisted on the site. If only root stobs and large diameter twigs remain, it was likely a more intense fire with longer heat residence time, and combined with other observations of soil conditions may result in a call of high soil burn severity. More common in chaparral is a condition of remaining small diameter twigs, indicating a flashy fire with short residence time. Combined with other observations of soil conditions this usually resulted in a classification of moderate soil burn severity even though the canopy was partially consumed.

Satellite image-derived maps called Burned Area Reflectance Classification (BARC) were obtained to help map soil burn severity classes throughout the burned landscape (see Map 1). A BARC is a map of degree of post-fire changes in spectral reflectance. The BARC is created by comparing near infrared and shortwave infrared reflectance values and measuring the difference between pre-fire and post-fire satellite images (see http://www.fs.fed.us/eng/rsac/baer/barc.html for more information). Since vegetation condition is the primary factor affecting post-fire spectral response in remotely sensed images, the BARC must be adjusted to fit ground observations before it can accurately be referred to as a soil burn severity map. Field and aerial observations provided the field data necessary to make adjustments to the BARC to create the map of soil burn severity classes.

Soil Erosion/Debris Flow

Soil erosion potential following a fire is generally increased over pre-fire potential. This is largely due to loss of soil cover (forb, grass, leaf, and needle litter), surface horizon soil organic matter responsible for structural stability, and in some cases, increased water repellency at or near the soil surface. The amount of increase over pre-fire condition is related to the degree of soil changes.

Important factors in any erosion model that are most affected by fire are the same; the amount of

effective soil cover, the inherent susceptibility to soil particle detachment by wind, water, or gravity (a function of soil texture and structural stability), and the surface infiltration rate. As discussed above, these characteristics vary by degree of soil burn severity, and an area of high soil burn severity can be expected to show a larger increase in sediment production than an area of low soil burn severity. It is important to understand pre-fire erosion behavior when assessing post-fire erosion, since some areas have water repellant surfaces and inherently high erosion potential even before the fire.

For the Rush Fire, the soil burn severity was light to moderate with pockets of severe in the mountainous areas. The Erosion Risk Management Tool (ERMiT, 2006) was used to estimate soil erosion in the upper Skedaddle Creek and the Upper Deep Creek watersheds, which represented the steeper drainages in the Skedaddle Mountains that contained pockets of severe soil burn severity. The ERMiT tool is an interface developed specifically for post-fire rapid assessments, and uses the Water Erosion Prediction Project (WEPP, 2006) erosion model, which considers soil burn severity. The model was run for each soil mapping unit, and the sediment yield results were multiplied by the total acres of the soil mapping unit in the watershed, providing the total sediment yields. Data for the soils were obtained from NRCS soil surveys, and vegetation was assumed to be 70% shrub, 18% grass, and 12% bare ground based on pre-fire vegetation surveys. Slope values used were the average slopes for a given soil mapping unit, calculated in ArcMap. Debris flow potential was not modeled due to the low values at risk within the watersheds.

Watershed Response

Overland flow occurs as a result of rainfall that exceeds soil infiltration capacity and the storage capacity of depressions. In unburned areas, overland flow often doesn't occur at all and when it does it follows a myriad of interlinking flow paths that constantly change as organic material (litter and duff layers) and inorganic material (rock) are encountered (Huggins and Burney, 1982). Consumption of vegetation, surface litter, and soil organic matter by fire alters the path of overland flow by reducing the overall length of the flow path, resulting in the concentration of flow into a shorter flow path. This concentration of overland flow increases the hydraulic energy of the flow and can result in rill erosion. At the watershed scale, the reduction of hillslope flow path lengths and the formation of rills that have a high water conveyance capacity reduce the times of concentration or the amount of time for overland flow to reach a defined point within the watershed.

Overland flow is also increased if there is an increase in water repellency (hydrophobicity) of the soils because of the fire. This can reduce infiltration and increase overland flow (runoff) (DeBano et al., 1967). Infiltration curves for water repellent soils reflect increasing wettability over time once the soil is placed in contact with water. Water repellency decreases (hence infiltration increases) with time as the substances responsible for hydrophobicity begin to break down, thereby increasing wettability. In general, fire-induced hydrophobicity is broken up or is sufficiently washed away within one to two years after a fire (Robichaud, 2000). The thicker and deeper the water repellant layer, the longer it will take to dissipate. Also, as noted above, many of the soils in these vegetation communities are water repellant prior to the fire (i.e.: not fire-induced), and in these cases the water repellency will likely persist. However, once soil cover and vegetative canopy begin to recover, this persistent water repellency becomes less significant

to the runoff response since the litter and canopy quickly restore protection of soil and obstruction of overland flow, thus enhancing infiltration and reducing energy for runoff and erosion.

Raindrops striking exposed mineral soil with sufficient force can dislodge soil particles. This is known as splash erosion. These dislodged particles can fill in and seal pores in the soil thereby reducing infiltration. Further, once soil particles are detached by splash erosion they are more easily transported in overland flow. Surface erosion is defined as the movement of individual soil particles by a force (wind, water, or gravity), and is initiated by the planar removal of material from the soil surface (sheet erosion) or by concentrated removal of material in a downslope direction (rill erosion). Surface erosion is a function of four factors: 1) susceptibility of the soil to detachment, 2) magnitude of external forces (raindrop impact or overland flow), 3) the amount of protection available by material that reduces the magnitude of the external force (soil cover), and 4) management practices that can reduce erosion (Foster, 1982; Megahan, 1986).

On-the-ground field observations and aerial reconnaissance within and downstream of the burned area were conducted to determine potential watershed response. Channel morphology related to transport and deposition processes were noted, along with channel crossings and stream outlets. Observations included condition of riparian vegetation and the volume of sediment stored in channels and on slopes that could be mobilized.

B. Findings

Soil Burn Severity

The Rush fire was dominated by very low to light soil burn severity. Moderate soil burn severity was mostly limited to sites adjacent to areas mapped with high burn severity. High soil burn severity occurs as isolated patches in the headwaters of canyons and drainages at higher elevations and in pockets of denser vegetation. Very low and unburned areas are also extensive within the fire perimeters. Acres of the burn severity classes in the Rush Fire are listed in Table 3.3.2. The general characteristics of the soil burn severity classes as mapped are described in Table 3.3.3.

Table 3.3.2 Burn Severity Classes

Burn Severity Class	Amount (acres)	Percent of Total Burned Area
1 - Unburned to Very Low	71,964	22.8
2 - Low	149,101	47.2
3 - Moderate	93,847	29.7
4 - Severe	799	0.3
Total	**315,711**	**100.0**

The general accepted view of the Burn Severity Map is it overestimated the soil burn severity except in the higher elevation areas of the Skedaddle Mountains. The vegetation mortality of the shrub-dominated ecosystems is thought to be high in the Moderate Burn Severity Class and moderate in the Low Burn Severity Class. The vegetative communities in the higher elevation areas of the Skedaddle Mountains are expected to mostly recover naturally from the fire. See the vegetation assessment for more detailed information.

Table 3.3.3 General Characteristics of the Soil Burn Severity Classes

Soil Burn Severity	Characteristics
Unburned to Very Low	Unburned islands within the fire perimeter, and areas where very low severity ground fire occurred. Vegetation canopy, ground cover, and soil characteristics are not altered significantly from pre-fire conditions. A thin water repellant layer occurs throughout these areas.
Low	Shrub canopy and grasses may be scorched or consumed. Unburned and charred, but recognizable, grasses and shrub litter are present at the surface. A moderate, thin water repellent layer may be present at the ash-soil interface, under or near vegetation clumps. The water repellent layer is discontinuous and may not be fire-induced. Little to no water repellency observed between vegetation clumps. There were unburned patches of bare ground between shrubs. In forested areas, light ground fire may have occurred but litter and duff remain largely intact and forest canopy is generally unaffected.
Moderate	In chaparral areas, shrub canopy is consumed, with stobs and stems remaining. Unburned and recognizable charred leaf litter and twigs remain beneath the ash in shrub areas; a moderate, thin water repellent layer may be present but discontinuous under trees and shrubs. In forest areas, leaf litter and fine surface fuels may be consumed, but conifer or hardwood canopy is scorched but not consumed and will soon become soil cover/mulch. Unburned patches between shrubs and trees are smaller but still present.
High	Generally areas where conifer or hardwood canopy cover was dense (greater than 60-80%) and pre-fire litter layer was deeper and more continuous. Some charred, but recognizable organic material may be present in or beneath a thick ash layer. Water repellency may be present, but is also present under unburned hardwood litter and may not be fire-exacerbated.

Erosion Potential/Debris Flow Potential

Potential erosion has increased in the burned areas as a result of the fires. The most significant increases occurred in areas where soil burn severity was moderate or severe, and where slopes are steep (greater than 35%). In the Rush Fire, there are only a few areas that have these conditions, which are predominately in the mountain areas. The steep slopes and drainages within the north-facing slope of Skedaddle Mountain contain stored sediment with high potential for mobilization into surface erosion and debris flows if significant precipitation occurs over a short period of time.

The steeper slopes are 50 to 90% rock cover that will have high runoff but will remain as sheet flow across and around the rock cover. Lower gradient slopes have rock cover from 10 to 50% which will also have minimal increased erosion due to the fire. In all areas, ash flow (also known as black water), will occur during the first couple of rain events depending on rainfall intensity. The ash flows may carry woody debris and cobble-sized rock in the channels and onto the alluvial fans depending on the storm intensity and duration. There are no practical treatments for these initial ash flow events unless a high value at risk, such as life or real property, will be directly impacted. No such values at risk were found (exceptions may be in the archeology assessment).

The ERMiT modeling tool was used to estimate the sediment yield resulting from soil erosion for the Upper Skedaddle Creek and Upper Deep Creek watersheds (appendices D and E, respectively). Model results show a decrease in sediment yield of about 13-15% for the Upper Skedaddle Creek watershed, and a 15-19% decrease in sediment yield for the Upper Deep Creek watershed under the treatment of seeding compared to no treatment. The Upper Deep Creek

watershed was predicted to deliver significantly more sediment than the Upper Skedaddle Creek watershed, partly due to the Upper Deep Creek watershed having more burned acreage.

Watershed Response

The Rush fire was not specifically modeled for changes in storm runoff because either no values-at-risk were identified downstream or downslope of burned areas; or the values-at-risk were determined to be at low risk of damage due to post-fire storms. Overall, the Rush Fire was mapped as predominantly low runoff potential with isolated areas of moderate runoff potential, corresponding with the mosaic of predominately unburned and low soil burn severity. The southern part of the Rush Fire contained more areas of moderate and high runoff potential, but still was predominantly a mosaic of unburned and low, also corresponding to the large amount of unburned and low soil burn severity. The primary watershed response of the Rush fire is expected to include: 1) an initial flush of ash and organic debris; and 2) small amounts of localized erosion and deposition in response to typical precipitation events.

Field investigations indicated moderate water repellency in unburned areas, as well as areas within the fire, indicating a natural tendency to repel water. As a result, post-fire runoff and erosion are not expected to increase significantly over pre-fire levels. Debris deposition and recent alluvial deposits were observed in channels and foothills of the burned area. These are expected to continue to occur at natural background levels with a minimal increase of sediment or debris as a result of the fire. Temporary increases in spring flow and stream baseflow may occur due to the reduction in interception and evapotransportation where dense shrub canopies were consumed by the fire. However, these short-term increases are expected to return to pre-fire levels within 1-5 years as fire-adapted shrub communities re-sprout.

Throughout all fire areas, vegetation recovery is largely dependent on climatic cycles. If wet winters occur, vegetation recovery could be rapid, with forbs and grasses providing ground cover similar to that observed in unburned areas throughout the fires. By the second winter season, forbs, grasses, and re-established shrubs should provide sufficient cover to reduce any increase in watershed response to near pre-fire levels. Once sprouting vegetation begins to produce brushy crowns and a duff/litter layer, watershed response will be reduced further. However, if winters are dry, vegetation recovery will be slow, and thus the establishment of ground cover and shrub communities will be slow, and watershed response will remain slightly elevated over pre-fire conditions.

The runoff potential in the first year following the fire in areas of dense shrubs and rated as moderate on the burn severity map will be higher than pre-fire due to the loss of leaf canopy. After the first year, recovery of vegetative canopy is generally sufficient to reduce the runoff potential significantly, thus reducing the runoff potential back to near pre-fire levels over the next several years.

The effect of wildfires on storm runoff is well documented. Wildfires typically cause an increase in watershed responsiveness to precipitation events. Burned watersheds can quickly yield runoff due to the removal of protective tree and shrub canopies and litter and duff layers, thus producing flash floods. Burned areas often respond to the local storm events in a much flashier way. The amount of water yield increase is variable and it is often orders of magnitude larger

than pre-fire events. These negative impacts are predominantly true in watersheds that experienced significant consumption of the shrub community and moderate to high soil burn severity effects. Fires may increase the number of runoff events as well since it generally takes a smaller storm to trigger runoff until vegetation begins to recover. Peak flow increases from the fire may also be augmented by debris flows of floatable and transportable material within the active channel areas and steep, incised drainages.

Values at Risk

Aerial reconnaissance and field evaluations were conducted throughout the Rush Fire to determine if threats to life, property, or critical cultural or natural resources were present on federal lands and in a few instances private lands in close proximity to federal lands. Ram Horn campgrounds, roads, and cultural sites were evaluated for risk from increased erosion, flooding or debris flows.

A preliminary assessment of risk to non-federal lands and to major travel routes from increased runoff, erosion, and debris flow was conducted by aerial and field evaluations. The major travel routes in and adjacent to the Rush Fire were evaluated by the Facilities Team and documented in the Facilities Assessment.

RECOMMENDATIONS

The following recommendations are based on the results of the above observations:

A. **Emergency Stabilization – Fire Suppression Repair:** No treatments are recommended under this category.

B. **Emergency Stabilization**

Soil Stabilization for Stony Creek Meadow: Engineer and implement stream bed stabilization and sediment capture using low gradient rock weirs. Rock weirs will be installed at the lower end of Stony Creek meadow to create low gradient pools that will promote woody vegetation growth, sediment and ash capture, and raise the water table in the meadow. This will promote a healthy, functioning meadow and prevent degradation from fire-induced runoff events.

Stock water reservoir cleanout: Ash and sediment will be captured in many stock water reservoirs. The ash and sediment will reduce the water holding capacity resulting in less water for livestock and wildlife. The ash and sediment removed should be placed downstream of the reservoir and upslope from the downstream channel.

Livestock exclusion in riparian areas: Riparian areas are critical to protecting the channels from erosion and support sediment capture. Exclusion should occur for a minimum of 2 years and limited grazing of riparian areas should be in effect for a minimum of 5 years to allow successful reestablishment of healthy riparian function.

Flood Warning Signs: Install six flood warning signs in strategic locations on BLM roads in proximity of upper Skedaddle Creek and upper Deep Creek watersheds, and also in the area of Deep Cut. These signs are necessary to inform the public of immediate danger posed by flash

flooding from storm events.

Treatments Considered But Not Recommended: Hillslope treatments were considered for the Rush fire for erosion control. The treatments considered were wood and straw mulching, seeding, contour felled logs, log erosion barriers, and fiber rolls. Environmental considerations were evaluated to determine treatment suitability which includes slope grade, slope length, soil burn severity, canopy cover, land ownership, watershed response, and access.

The low soil burn severity and runoff potential of the area excluded the need for hillslope treatments. Contour felled logs and log erosion barriers are not feasible due to the amount of surface rock, undulating soil surfaces, and lack of trees.

C. **Rehabilitation:** No treatments are recommended under this category.

D. **Management Recommendations – Non-Specification Related**

Flood warning signs on major access roads: During major storm events, sections of Wendel Road and Rye Patch Road can be expected to flood. Flood warning signs will alert travelers to potentially hazardous road conditions during and immediately after storm events.

3.4 Riparian and Wetland Sites and Water Quality

Prior to the Rush Fire the BLM evaluated the condition and health of riparian and wetland sites within the fire perimeter using Riparian Functional Assessments, between 1995 and 2010. These assessments were made as part of the livestock grazing permit renewal process for the seven grazing allotments that contain riparian and wetland sites.

Riparian Proper Functioning Condition (PFC) is utilized as a qualitative method for assessing the condition of riparian and wetland areas. The term PFC is used to describe both the assessment process, and a defined, on-the-ground condition of a riparian area. The on-the-ground condition termed PFC refers to how well the physical processes are functioning. PFC is a state of resiliency that will allow a riparian area to hold together during high flow events with a high degree of reliability. The assessment of these sites was done following the guidance and checklist provided in Technical Reference 1737-9.

Table 3.4 below summarizes the Determinations of Land Health made by the BLM, and lists the allotments that were meeting the Riparian/Wetland standard prior to the fire, the allotments that were not meeting the standard, and those that were not meeting, but making progress towards meeting the standard. The BLM has determined that the Twin Peaks Allotment is not meeting the Riparian/Wetland Standard, and the Observation Allotment is Not Meeting, but is Making Progress towards Meeting the standard.

Table 3.4 Determination of Land Health for the Riparian/Wetland Standard Pre-Fire

Land Health Standard	Livestock Grazing Allotment(s)			Causal Factors for Allotments Not Meeting Standard
	Meets Standard	Does Not Meet Standard	Not Meeting, Making Progress	
Riparian/ Wetland	Winter Range California Spanish Springs AMP Deep Cut Tuledad	**Twin Peaks**	**Observation**	High utilization and trampling by excess numbers of wild horses Stream flow restrictions on private lands

Many of the riparian and wetland sites that have been affected by the Rush Fire have made considerable progress in meeting riparian health standards over the past twenty years. This is due to many changes in the livestock grazing regimes that restrict grazing to certain periods each year, from managing wild horse and burro populations within established AMLs, and from fencing several of the riparian sites which allows for rest from livestock grazing. However, during the 2009-2010 inventories, the BLM found that many riparian sites were experiencing a much higher level of utilization and trampling, as a result of excess numbers of horses and burros above the AML. Many sites appeared to be in a downward trend prior to the Rush Fire, and are at risk of becoming more severely degraded if grazing use from livestock and wild horses is not reduced during the first two years following the fire to allow these areas to recover.

Purpose and Need of Rush Fire Emergency Stabilization and Rehabilitation Treatments

Many riparian areas within the Rush Fire perimeter did not burn, however fire did burn to the edges of nearly all sites. A great deal of the upland vegetation around these springs sources were affected. The loss in upland vegetation will increase the likely hood of wild horses and burros migrating to unburned islands for forage. The concentration of animal use within those sites will increase whereas prior to the fire animals were more spread out. The increase use by wild horse and burros on these sites could potentially change the functionality of each riparian area near the unburned islands, increasing the potential for soil degradation and riparian plant mortality. This will then affect the wildlife, including sage-grouse, which depend on riparian areas for brood rearing habitat.

The 33 previously fenced sites and the 9 new sites proposed for exclosure fencing have been visited by a resource specialist and were chosen in conjunction BLM range and wild horse and burro staff by using their local knowledge of wild horse and burro movement. The proposed construction of each exclosure will be effective in the protection of key riparian areas used by wildlife and wild horses and burros.

The meadow adjacent to Stony Creek has a head cut at the lower end that is beginning to destabilize the meadow. Approx. 1,800 feet of stream channel is affected by the head cut and approximately 30 acres of the meadow needs to be protected from erosion. The meadow is considered as functioning and consists primarily of native wetland plant species in the main flow channel. Without treatment it is predicted that the head cut will continue to erode, be unable to trap sediment and fire related ash in the channel, reduce water table elevations in the meadow,

and degrade wildlife habitat diversity.

Assessment for values at risk identified two significant archaeological sites, one at Deep Creek and the other at Indian Springs that are at risk from post-fire erosional events. Both of these sites are in areas of moderate to high burn severity. The site to be treated at Deep Creek is a very large lithic scatter totaling approximately 20 acres, and part of which is located on an alluvial fan where two tributaries meet. This part of the site was already experiencing erosion prior to the fire as evidenced by incipient channelization that is occurring in at least two locations on the fan. The fire has completely removed the vegetation along the entire expanse of the fan, consequently creating conditions that will exacerbate the erosion that is already occurring. Much of the remainder of the site is located on a toe slope and terrace adjacent to the Deep Creek main channel. The slope above this area has burned and is likely to transport materials onto and potentially scour the surface below during a significant precipitation event.

The second site suitable for treatment under this specification is located at Indian Springs. This resource is a very large multicomponent site consisting of a very large lithic scatter encompassing approximately 60 acres surrounding the historic spring development at Indian Spring. The historic portion of the site, the area closest to the spring was not burned, but at least 20 acres of the archaeological cultural deposit was burned and the vegetation completely consumed. The slopes above the spring and to the south and west have burned and require treatment to retain site integrity. The burned slopes are likely to be affected by any significant precipitation event. Treatment of the slopes above the cultural deposits will prevent erosion on the lower slopes. The importance of this site cannot be understated. The cultural resources assessment conducted in this area indicates intensive prehistoric human occupation in an upland landscape where little research has been conducted and settlement patterns are poorly understood. The presence of additional sites located on similar landscape features were noted, but time constraints prohibited further assessment at this time.

The high values at risk at these locations are to be treated through a mixed strategy that will accelerate and encourage re-vegetation; preserve soils through slowing and re-directing post-fire flows, while discouraging wind erosion; and restrict on-site vehicular and foot traffic. Treatments to be implemented involve seeding, mulching, lop and scatter of available downed or standing dead trees, installation of straw wattles and grade dips, and placement of rock barriers and warning signs.

Drill seedings are planned to restore native vegetation adjacent to Deep Creek, Rush Creek, West Fork Buffalo creek, Byers Spring and Upper Smoke Creek. These sites have important biological and cultural resources and the floodplain vegetation was severely consumed by the Rush Fire. The reestablishment of native species at these sites will provide for site stabilization, riparian function, and improved wildlife habitat.

Water Quality

The Rush Fire has caused increased watershed flow in several watersheds that has resulted in 100 man-made water catchments (pits and reservoirs) to become filled with excess sediment and debris from adjacent uplands. There is a need to monitor each of these sites and make assessments of their condition and repair needs. The BLM has estimated that most of these 100

catchments need to be cleaned out to improve drinking water quality for wildlife, wild horses and burros, and livestock. The inflow and outflow at each site would also be assessed for any damages caused by post-fire precipitation runoff.

3.5 Upland Vegetation and Land Health Assessments

Prior to the Rush Fire the BLM conducted Land Health Assessments in all nine grazing allotments in the Rush Fire perimeter between 2000 and 2009. These assessments were made as part of the livestock grazing permit renewal process. These assessments were conducted by an Interdisciplinary (ID) Team consisting of a botanist, soil scientist, ecologist, wildlife biologist, and rangeland management specialist. The ELFO area has Natural Resources Conservation Service (NRCS) Order 3 Soil Survey coverage. NRCS Ecological Sites were used as the reference sites (called for in Pellant et al., 2000). The two standards that are used to evaluate resource conditions of upland vegetation are: (1) Upland Soils, and (2) Biodiversity.

Table 3.5 below summarizes the Determinations of Land Health made by the BLM pre-fire, and lists the allotments that were meeting the Upland Soils and Biodiversity Standards, the allotments that are not meeting the standards, and those that are not meeting, but making progress towards meeting the standards.

Table 3.5 Land Health Determinations for the Upland Soils and Biodiversity Standards Pre-Fire

Land Health Standard	Livestock Grazing Allotment(s)			Causal Factors for Allotments Not Meeting Standard
	Meets Standard	Does Not Meet Standard	Not Meeting, Making Progress	
Upland Soils	Observation Winter Range California Twin Peaks Spanish Springs AMP Twin Buttes Spanish Springs Ind. Shinn Peak	**Deep Cut**		Lack of perennial cover and/or litter from historic livestock grazing
Biodiversity	Observation	**Twin Peaks** **Deep Cut** **Winter Range California**	**Spanish Springs AMP** **Twin Buttes** **Spanish Springs Ind.** **Shinn Peak**	Presence/dominance of invasive annual grasses Wildfire Historic livestock grazing Seedings

Summary of Upland Vegetation and Land Health Assessments

Plant communities that were burned by the Rush Fire contain several areas where upland vegetation has been impacted by previous wildfires, historic livestock grazing, and other disturbances, which have degraded native plant communities. While most allotments exhibit healthy soils, and meet the Upland Soils Standard, most allotments also have altered native plant communities from past disturbances, and do not meet the Biodiversity Standard. The amount of biodiversity in a plant community has a direct correlation to the quality of wildlife habitat. Sites

that have low biodiversity have lost a high percentage of their herbaceous perennial plant component, and are comprised of a higher percentage of shrubs, and have been invaded by annual grasses. These sites typically produce lower amounts of biomass, forage, and cover.

Purpose and Need of Rush Fire Emergency Stabilization and Rehabilitation Treatments

The Rush Fire consumed 315,577 acres of predominantly upland vegetation types. Overall vegetation burn severity inside the fire perimeter is 85-95%, with most individual plants completed consumed. Severe drought conditions have also greatly compounded the effects of the Rush Fire on native vegetation and forage and water resources. The Bull Flat weather station recorded an average annual precipitation of 6.6 inches over the previous 11 years, and in 2012 recorded 4.5 inches of precipitation from the beginning of the water year (October 1, 2011) until the fire started in August. In the months of May through August, 2012, only 0.3 inch of precipitation was recorded, for a total of 4.8 inches.

The BLM has estimated that native grass production grew only 20 to 30% of normal in 2012 at low elevations, and only 40 to 50% of normal production at mid to high elevations grew (Wilson, 2012). These conditions have substantially reduced the forage availability for livestock, wild horses and burros, and wildlife pre-fire, and continue to affect forage growth in unburned islands. In addition, approximately 50% of the developed pits and reservoirs that usually contain water into the fall were dry by early to mid-summer in 2012 (Farris, 2012). Many riparian and spring sites experienced higher use levels from livestock, wild horses, and wildlife pre-fire due to water shortage in adjacent areas.

It generally takes two years or longer to successfully establish a new seeding, especially when establishing native plants in an arid environment. During years of below normal precipitation or drought, longer rest periods from livestock grazing may be needed to meet the goals and objectives. It is extremely important to allow re-sprouting vegetation to recover and newly seeded species to become firmly established.

Within burned areas of the allotments, vegetation burn severity is high, with 80-95 percent of all grasses, forbs, and shrubs being completely or partially consumed by the fire. The purpose of livestock grazing closures is to:

1. Allow natural recovery of plants that will recover on their own to occur (from regrowth or sprouting), without the added pressure and stress of defoliation from livestock grazing.
2. Allow the germination and initial growth of seeded plants to occur without ground disturbance from livestock hoof action and trailing.
3. Allow seeded plants to establish for at least two years so they are adequately rooted in the soil, to avoid them from being physically pulled out of the soil from livestock grazing.
4. Allow seeded plants to grow into mature plants with sufficient leaf growth for photosynthesis and the ability to produce seed before they are grazed.
5. Allow riparian areas and wetlands, which are highly preferred grazing areas, to rest from livestock grazing pressure to allow for full recovery of riparian plant growth and vigor to ensure the proper functioning of riparian/wetland sites.

6. Allow native plants to recover from wildfire through regrowth and sprouting to provide food, cover, and shelter to wildlife, especially in mule deer, pronghorn, and greater sage-grouse habitats.

Maintaining a balance of grazing animals, and controlling the timing and amount of forage that is consumed each year by livestock and wild horses is crucial to maintaining healthy upland plant communities. Recently burned plant communities that have been impacted in the past by other wildfires and historic livestock grazing are very vulnerable to losing more of their native perennial grass component, when grazed during the first two growing seasons after a fire.

Sites that are already close to crossing an ecological successional threshold to annual species, or sites that are adjacent to water sources are the most vulnerable. While many upland communities are in a healthy condition, some sites had already experienced high levels of grazing utilization from livestock and/or wild horses and burros, and are in danger of being in a downward trend. Now that the vegetation has been burned over, if these upland communities are continually grazed, they will decrease in soil stability, biodiversity, vigor, and production.

3.6 Noxious Weeds and Invasive Plants

The Rush Fire burned 315,577 acres of BLM rangelands and there were 166 miles of dozer lines built during fire suppression activities. These factors have resulted in the potential establishment and expansion of new and existing noxious species within the burned area. There is a very high concern for existing infestations of Scotch thistle and yellow starthistle. History has shown these two species have an incredibly high rate of spread after fire activity. There is also a very high concern for the spread of perennial pepperweed due to the use of water tenders that were drafting from an infested water source. These water tenders were used for dust abatement along roads inside and outside the fire perimeter along with filling engines for fire suppression.

Ground disturbing activities (e.g. dozer lines) present a great potential for new infestations. Hitchhiking propagules of noxious weeds could have been picked up from existing infestations or brought in from the fire equipment's original location and spread along fire routes. Areas used for helicopter bucket drops that were infested with weed species are also a high priority. All invasive and noxious species treatment will be in compliance with BLM Policy and the integrated Weed Management Program, BLM Lands, Surprise, and Eagle Lake Field Offices, Nevada Lands Portion, Environmental Assessment (EA) EA# CA-350-04-01, April 2004, DNA 2012-CA-350-01.

The following table outlines the noxious weeds known to occur, and total acreage.

Table 3.6 Infestations of Invasive Plants within the Rush Fire Perimeter

Species Name	Scientific Name	Total Acres Infested
Canada Thistle	*Cirsium arvense*	9
Dyers Woad	*Isatis tinctoira*	1

Species Name	Scientific Name	Total Acres Infested
Hoary Cress	*Cardaria draba*	1
Perennial Pepperweed	*Lepidium latifolium*	19
Scotch Thistle	*Onopordum acanthium*	84
Yellow Star Thistle	*Centaurea solstitalis*	8
Russian Olive	*Elaeagnus angustifolia*	1
Russian Knapweed	*Acroptilon repens*	24
Halogeton	*Halogeton glomeratus*	6

3.7 Special Status Plants

There are populations of three known special status plants within the Rush Fire Perimeter: Susanville penstemon, silverleaf milkvetch and Suksdorf's milkvetch. Table 3.7 below lists the plants and their category of listing through the California Native Plant Society (CNPS).

Table 3.7 Special Status Plant Species within the Rush Fire Perimeter

Plant Scientific Name	Plant Common Name	California Native Plant Society (CNPS) Listing [1/]
Penstemon sudans	Susanville penstemon	List 1B
Astragalus pulsiferae var. *suksdorfii*	Suksdorf's milkvetch	List 1B
Astragalus argophyllus var. argophyllus	Silverleaf milkvetch	List 2

[1/] List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

There are 16 populations of Susanville Penstemon (*Penstemon Sudans*) known to exist in the western portion of this fire. This species belongs to the Scrophulariaceae family and generally has sticky stems and leaves with creamy white flowers. These populations are often found in rocky soils and rock outcrops of sagebrush scrub and yellow pine forests (Jepson, 1996). Susanville penstemon populations known to occur within the fire perimeter can be found at the top of Observation Peak and Shinn Mountain and along the canyon walls of Stony Creek.

Silverleaf milkvetch, (*Astragalus argophyllus var. argophyllus*) and Suksdorf's milkvetch, (*Astragalus pulsiferae var. suksdorfii*) belong to the fabaceae (Pea) family. These are both small plants with lacy type leaves and distinct pea-like flowers. These species tend thrive in areas where there is some type of disturbance. They can be found near trails, roads and areas where animals tend to frequent and they prefer dryer, sandy soil types (Jepson, 1996). There are six

populations of silverleaf milkvetch known to occur within the fire perimeter. These populations are on the eastern edge of the fire line in the Rush Creek Area. There are 17 populations of Suksdorf's milkvetch known to exist within the fire perimeter. These can be found near the top of Observation Peak and in the southern portion of the Five Springs Wilderness Study Area.

3.8 Wildlife Habitat

The following wildlife species of concern and their respective habitats were identified as occurring within the Rush Fire perimeter:

Table 3.8.1 Wildlife Species of Concern within the Rush Fire Perimeter

Species	Scientific Name	Status
Greater Sage-grouse	*Centrocercus urophasianus*	Federal Candidate; BLM Sensitive
Mule Deer (East Lassen Herd)	*Odocoileus hemionus*	Locally important (Hunt Zone X5b)
Pronghorn	*Antilocapra americana*	Locally important (Hunt Zone 4)

Threatened and Endangered Species

Carson Wandering Skipper: The Carson wandering skipper (*Pseudocopaeodes eunus obscurus*) is a Federally Endangered butterfly species known to occur in portions of Lassen County and neighboring Washoe County, Nevada. The BLM ELFO has been performing surveys on potential habitat for the skipper, and no suitable habitat is known to occur within the fire area. Surveys have been completed to validate potentially suitable habitat in cooperation of USFWS personnel. Critical Habitat for the Carson wandering skipper has not been designated.

Candidate Species

Greater Sage-Grouse: The Greater Sage-grouse is considered an obligate user of sagebrush, depending on large, woody shrubs of big sagebrush (*Artemesia tridentata* ssp.) for food and cover year-round (Connelly et al. 2011). Seasonal habitats include leks (open, traditional display areas), nesting habitat dominated by sagebrush with horizontal and vertical structural diversity, brood-rearing habitats of riparian areas and wet meadows, and winter habitat where sagebrush is exposed above snow levels.

The Greater Sage-grouse now occupies approximately 56 percent of its historic range (Schroeder et al. 2004) in 11 states (Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Colorado, Utah, South Dakota, and North Dakota) and 2 Canadian provinces (Alberta and Saskatchewan). Based on factors including habitat loss, inadequacy of existing regulatory mechanisms, and declining population trends, the FWS concluded in its 12-month finding that the Greater Sage-grouse is warranted for listing under the Endangered Species Act, however the listing is precluded by higher priority listing actions (75 FR 13988). A final rule on listing of the Greater Sage-grouse is expected in 2015.

BLM Policy and Guidance: In response to the FWS 12-month finding, the BLM set forth interim policy in its Instruction Memorandum No. 2012-043 Greater Sage-Grouse Interim Management Policies and Procedures. Under the guidance, Preliminary Priority Habitat (PPH) and

Preliminary General Habitat (PGH) were designated in coordination with state wildlife agencies. PPH comprises areas that have been identified as having the highest conservation value to maintaining sustainable populations, including breeding, late brood-rearing, and winter concentration areas. PGH includes areas of occupied seasonal or year-round habitat outside of priority habitat. Total acres of each habitat designation within the Rush Fire perimeter are displayed in Map 1 and enumerated in Table 3.8.2 below:

Table 3.8.2 Preliminary Priority and General Sage-grouse Habitat within the Rush Fire Perimeter

Sage-grouse Habitat Type	Area (acres)		
	California	Nevada	Total
Preliminary Priority Habitat	252,310	39,059	291,369
Preliminary General Habitat	0	1,455	1,455
Total	252,310	40,514	292,824

IM-2012-043 provides the following guidance for Wildfire Emergency Stabilization and Burned Area Rehabilitation within PPH:

- *In Emergency Stabilization and Burned Area Rehabilitation plans, prioritize re-vegetation projects to (1) maintain and enhance unburned intact sagebrush habitat when at risk from adjacent threats; (2) stabilize soils; (3) reestablish hydrologic function; (4) maintain and enhance biological integrity; (5) promote plant resiliency; (6) limit expansion or dominance or invasive species; and (7) reestablish native species.*
- *Increase post-fire activities through the use of integrated funding opportunities with other resource programs and partners.*
- *In areas burned within the past 5 years, ensure that effectiveness monitoring outlined in post-fire stabilization and rehabilitation plans continues and report the results as outlined in WO-IM-2010-195. Post-fire stabilization and rehabilitation monitoring should continue until post-fire objectives are met.*

Habitat Suitability: The Rush Fire was virtually entirely within the Buffalo-Skedaddle Population Management Unit (PMU) of Greater Sage-grouse, burning 19% of the total area of the PMU. Habitat degradation has been extraordinary in the region, including juniper expansion and the invasion of exotic grasses (COT 2012). Recent population trends have shown consistent increases during years of favorable environmental conditions, however habitat suitability is generally considered low throughout the PMU. The Conservation Strategy for Sage-grouse (*Centrocercus urophasianus*) and Sagebrush Ecosystems within the Buffalo-Skedaddle Population Management Unit (Northeast California Working Group 2006) ranked habitat suitability using "R" value categories. The R-values rated the 1,475,506 acres of sagebrush complexes within the PMU based on their ability to respond positively to management, as described below.

R-0: Areas with desired species composition which have sufficient, but not excessive, sagebrush canopy and sufficient grasses and forbs in the understory to provide adequate cover and forage to meet seasonal needs of sage-grouse (nesting, early brood, summer, and

fall/winter).

R-1: Areas with potential to produce sagebrush plant communities that have good understory composition of desired grasses and forbs, but lacks sufficient sagebrush canopy.

R-2: Areas with potential to produce sagebrush plant communities that have a sagebrush overstory, but lack sufficient herbaceous understory.

R-3: Areas with potential to produce sagebrush communities that have not crossed the threshold to becoming juniper woodlands but are in various stages of becoming dominated by juniper (mature sagebrush and seedlings present).

X-3: Areas which have crossed the threshold from sagebrush plant communities (sagebrush seedlings absent) into juniper woodlands.

R-4: Areas with potential to produce sagebrush communities (mature sagebrush and seedlings present) but whose understories are currently dominated by annual grass, forbs, or bare ground.

X-4: Areas that have crossed the threshold from sagebrush communities (seedlings absent) into annual grasslands, forbs, or bare ground.

Although this mapping has not been ground-verified, it provides a general picture of habitat availability and degradation within the PMU. R-values within the Rush Fire are displayed in Map 2 and enumerated below:

Table 3.8.3 Sage-grouse Habitat R-values within the Rush Fire

R-value	Amount in Total PMU (% pre-burn)	Amount Burned in Rush Fire (acres)	% of Rush Fire
R-0	8.4%	24,391	7.8%
R-1	22.0%	102,564	32.7%
R-2	4.5%	19,038	6.1%
R-3	0.3%	0	0%
X-3	6.6%	8,915	2.8%
R-4	46.0%	137,436	43.8%
X-4	12.0%	14,092	4.5%

Proportions within the fire perimeter are generally similar to the percentages available throughout the PMU. While the R-4 category may be over predicted, low elevation sites of both R-1 and R-4 are particularly at risk of converting to annual grasslands (X-4). Feasibility of seeding to combat the conversion is discussed in the vegetation assessment. The herbicide Plateau is not approved for use in California.

Post-fire Habitat Assessment: Active sage-grouse leks within the fire perimeter include seven in California and one in Nevada. Additionally, four Nevada leks occur close to the fire boundary. The extent of burned habitat within three miles of each lek was evaluated using the Burned Area Reflectance Classification (BARC) map. A three-mile buffer was chosen based on the results of various studies (e.g. ODFW 2009, Holloran & Anderson 2005), as well as analysis of available telemetry data. The BARC map was ground-truthed by wildlife/vegetation teams within the lek

buffers, as well as other teams working within the fire perimeter, and was found to be a good predictor of conditions on the ground. Soil burn severity was generally low throughout the area surveyed, but the BARC classifications predicted the observed burn severity on soils and vegetation. The wildlife/vegetation teams also collected data on vegetation composition in unburned islands surrounding lek locations. Percentages of the BARC classifications within the 3-mile lek buffers are displayed in Map 3 and enumerated below:

Table 3.8.4 Burned Area Reflectance Classification within 3-Miles of Sage-grouse leks

Lek Name	State	Unburned	Low	Moderate	Severe
Chalk Bluff	CA	56%	36%	8%	0%
Gilman	CA	61%	34%	5%	0%
Eastside Reservoir	CA	66%	31%	3%	0%
Sagehen	CA	21%	47%	32%	<1%
Shinn Ranch	CA	21%	49%	30%	<1%
Rush	CA	11%	62%	27%	<1%
Hall	CA	30%	52%	18%	<1%
Skedaddle	NV	50%	39%	11%	0%
Mixie Flat	NV	68%	19%	13%	0%
Little Adobe Flat	NV	85%	12%	3%	<1%
Parsnip 1	NV	84%	15%	1%	0%
Garden Lake	NV	85%	7%	8%	0%

Eight of the twelve leks were located outside or near the perimeter of the fire area, with significant portions of habitat within three miles remaining unburned. Sage-grouse are characterized as a landscape-scale species, inhabiting large, interconnected expanses of sagebrush (Connelly et al. 2011). While the unburned islands within the fire area should provide a seed source for the reestablishment of vegetation, it is unlikely that they are large enough to allow persistence of nesting at pre-burn levels.

In general, areas of low soil burn severity would be expected to recover naturally, as seed banks and grass crowns remain intact. Mountain big sagebrush (*Artemesia tridentata* ssp. *vaseyana*) often recovers after a fire from seed remaining in the soil, however basin big sagebrush (*Artemesia tridentata* ssp. *tridentata*) and Wyoming big sagebrush (*Artemesia tridentata* ssp. *wyomingensis*) are generally considered to be fire-intolerant and do not resprout after wildfire (Lambert 2005). Wyoming big sagebrush is the slowest of the big sagebrush species to recover due to low seed production in most years and dry conditions preventing establishment of seedlings (Rhodes et al. 2010). Wyoming big sagebrush habitats may take as long as 35 years to more than 50 years to recover. As mentioned above, much of the habitat within the fire perimeter is at risk of conversion to annual grassland. Seeding may assist in the prevention of conversion and decrease recovery time and should be attempted wherever possible in areas with a reasonable likelihood for success.

Water sources are important for grouse during the late-brooding period, providing insects and forbs as herbaceous vegetation desiccates in sagebrush uplands (Connelly et al. 2011). Springs

are relatively numerous throughout the burn area, although many exhibit degradation from use by livestock, wild horses, and burros. Some riparian vegetation was already observed resprouting during surveys, including sedges (*Carex* sp.), Great Basin wildrye (*Leymus cinereus*), and wild rose (*Rosa* sp.). Important spring sources are expected to be protected during regeneration due to rest from livestock, a planned wild horse gather, and recommended exclosure fencing. An evaluation of springs throughout the fire area is provided in the riparian assessment.

Regional Perspective: The Buffalo-Skedaddle PMU is currently the westernmost population of Greater Sage-grouse and maintains connectivity with continuous habitat available to the east (Roush pers. comm.). Population declines in northeastern California have placed the PMU into a situation where it is now an edge population, with leks "winking out" in the western half. The Rush Fire has likely changed the perception of long-term viability of the Buffalo-Skedaddle PMU, isolating populations in the western portion of the PMU with connectivity severed from other functional populations. It is possible that this western population will experience extirpation scenarios similar to those already seen in Modoc and northeastern Lassen counties to date.

Synthesis: The Rush Fire burned a large expanse of habitat important to the persistence of Greater Sage-grouse in the Buffalo-Skedaddle PMU. While rehabilitation planned under ESR is a good beginning, the availability of sagebrush habitat important to grouse will remain depressed for a number of decades and large expanses may never recover under currently available treatment regimes. Current focus on the Greater Sage-grouse has increased resources available for monitoring and habitat restoration. Tenacity and creativity are encouraged to capitalize on opportunities beyond the scope of the ESR plan in the attempt to restore ecosystem function to the area.

Mule Deer: Mule deer inhabit early-to intermediate-successional forests and brushlands, and prefer a mosaic of various-aged vegetation that provides woody cover, meadow and shrubby openings, and free water (Zeiner et al. 1990). Bitterbrush, mountain mahogany, and juniper are important habitats, as well as habitats with a dense groundcover of nutritious forbs. Critical green up in the fall and spring occurs annually on grass species. This green up is crucial forage for resident and migrating deer during the fall and spring periods and provides a source of high quality forage to supplement the lower quality sagebrush which dominates winter diets. In the fall, green up serves as maintenance forage for migrating deer, reducing their need to draw on stored body reserves. In the spring, when body fat reserves are depleted, and deer are most susceptible to the stresses of inclement weather, green up sustains them by providing high quality forage until quality browse such as bitterbrush and serviceberry, and herbaceous forbs become available. Deer require an adequate supply of highly digestible, succulent forage for optimal growth and reproductive success (Anderson and Wallmo 1984).

Foraging habitat is considered a limiting factor for mule deer in northeastern California, but lands managed by the Eagle Lake Field Office provide important transition or intermediate ranges (California Department of Fish and Game 1998). These ranges are important to deer preparing for fawning in spring and preparing for winter by gaining weight. In winter, requirements for fawning, fawn-rearing, and about 1/5 of the hiding cover are replaced with an increasing need for thermal cover. Mule deer use heavy shrub and tree cover and south-facing

slopes to conserve energy in winter, and north-facing slopes for cooling in summer.

CDFG manages deer within California under its Deer Management Program. The Lassen interstate mule deer herd (known as the East Lassen herd) ranges from the northwestern area of Nevada to the northeastern corner of California. Recent counts and information from CDFG (pre-Rush Fire) indicate a relatively small decline in local mule deer populations (Ehler, pers. comm.). Mule deer occur within the Rush Fire perimeter, occupying a variety of habitat types throughout the year. The Shinn Mountain and Observation Peak vicinity was identified as the prime priority summer habitat for mule deer (Ehler, pers. comm.). The following table depicts acres of mule deer habitat affected by the Rush Fire according to designations contained in the ELFO Resource Management Plan (RMP) Deer Priority Habitat Areas map:

Table 3.8.5 Type and Amount of Mule Deer Habitat Affected by the Rush Fire

Mule Deer Habitat Type in Rush Fire Perimeter	Amount (acres)
Little or no use	28,142
Summer	131,678
Transition	45,296
Winter	67,627
Yearlong	35,789

The post-fire habitat assessment in the greater sage-grouse section above addresses many of the issues and concerns regarding fire effects on wildlife habitat. Of particular concern for mule deer is the re-establishment of shrub and browse species for forage and cover, as much of the habitat within the fire perimeter is at risk of conversion to annual grassland. Acres of the BARC classifications within the mule deer habitat types displayed in the above table are shown below:

Table 3.8.6 Burned Area Reflectance Classification of Mule Deer Habitat

Mule Deer Habitat Type	Unburned	Low	Moderate	Severe
Little or no use	9,160	14,856.2	4,104.5	19.6
Summer	22,001.3	49,446.6	59,527.1	705.7
Transition	14,322.5	25,980.6	4,993.9	1.3
Winter	20,403.4	36,090.9	11,079.3	45.6
Yearlong	4,665.4	19,993.7	11,110.2	24.9

The Rush Fire occurred in California mule deer hunt zone X5b, one of California's premier deer hunting zones. Zone X5b is hunted during an archery season, a rifle season, and a muzzleloader season. The zone encompasses a total of 597,320 acres; approximately 435,562 acres of BLM land and 161,758 acres of non-BLM land. Additionally, the fire burned 43,666 acres of Nevada hunt zone 015. This area is deemed critical deer winter range by Nevada Department of Wildlife (NDOW) (Hampson, pers. comm).

Pronghorn: Pronghorn occupy low structured sagebrush habitats, agricultural fields on private lands, and some natural meadow areas. They prefer open rangeland that supports a variety of vegetative types, primarily grasses, forbs, and shrubs. Vegetation requirements include 50%

vegetation cover and 50% non-vegetation composed of 5-15% grasses, 5-10% forbs, and 10-35% shrubs. Vegetation diversity should be 5-10 grass species, 10-70 forb species (majority perennial, succulent), and 5-10 shrub species (O'Gara and Yoakum 2004).

CDFG manages pronghorn within California under its Pronghorn Management Program. Pronghorn numbers statewide declined significantly due to human-associated activities with only a small isolated population remaining in northeastern California. Small numbers of pronghorn relative to southeastern Oregon occur throughout the Eagle Lake Field Office area. The most recent count of pronghorn within the ELFO boundary, which occurred in 2011, resulted in the third highest count in the 58-year history of pronghorn surveys conducted by CDFG (Ehler, pers. comm.). Pronghorn occur within the Rush Fire perimeter, occupying a variety of habitat types throughout the year. The Secret Valley area (west, outside of the fire perimeter) east into the fire perimeter through the Five Springs WSA to Sand Pass Road, was identified as the prime priority winter habitat for pronghorn. The following table depicts acres of pronghorn habitat affected by the Rush Fire according to designations contained in the ELFO Resource Management Plan (RMP) Pronghorn Priority Habitat Areas map:

Table 3.8.7 Type and Amount of Pronghorn Habitat Affected by the Rush Fire

Pronghorn Habitat Type in Rush Fire Perimeter	Amount (acres)
Little or no use	17,644
Kidding	25,865
Spring/Summer/Fall	76,971
Winter	13,841
Priority Winter	6,645
Yearlong	167,564

The post-fire habitat assessment in the greater sage-grouse section above addresses many of the issues and concerns regarding fire effects on wildlife habitat. Of particular concern for pronghorn is the re-establishment of shrub and browse species for winter forage and cover, as much of the habitat within the fire perimeter is at risk of conversion to annual grassland. Acres of the BARC classifications within the pronghorn habitat types displayed in the above table are shown below:

Table 3.8.8 Burned Area Reflectance Classification of Pronghorn Habitat

Pronghorn Habitat Type	Unburned	Low	Moderate	Severe
Little or no use	1,705.5	4,112.7	11,521.6	302.2
Kidding	5,482.9	11,253	9,092.6	35.1
Spring/Summer/Fall	12,968.3	31,017.9	32,632.7	353.8
Winter	5,821.4	7,326.1	696.3	0.0
Priority Winter	1,794.9	4,643.4	207.3	0.2
Yearlong	42,779.4	88,015	36,664.5	105.6

The Rush Fire occurred in California pronghorn hunt zone 4, igniting on the last day of the archery season. Zone 4 is also hunted for two rifle periods (bucks only) and a junior hunt (either

sex). The zone encompasses a total of 2,069,827 acres within ELFO; approximately 686,127 acres of BLM land and 1,383,700 acres of non-BLM land. Additionally, the fire burned 43,666 acres of Nevada hunt zone 015. This area is deemed critical pronghorn winter range by NDOW (Hampson, pers. comm).

Wildlife Guzzlers: Wildlife guzzlers are important to wildlife for year-round access to water. The BLM ELFO maintains 32 guzzlers, and additional guzzlers exist in various locations on State lands. Ten BLM guzzlers and two guzzlers on State lands are located within the Rush Fire perimeter. Nine of the ten BLM guzzlers occur within Wilderness Study Areas (WSA). The guzzler not located within a WSA (Observation Peak) had a tank replacement in 2011; new apron materials had been purchased but not yet installed. This guzzler is located in a stand of mountain mahogany skeletons from the 2001 Observation fire; this area was classified by the BARC map as "severe" intensity. Observation Peak is high priority summer habitat for mule deer, thus this guzzler and the access to water it provides in this location is extremely important to this species.

Post-fire field visits to the guzzler locations have not occurred, with one exception. During BARC map ground-truthing field visits, individuals from a wildlife/vegetation team reported that the East Bull Flat guzzler was damaged in the fire; the fiberglass tank had degraded and flaked off. Although the other guzzler sites have not been assessed, it is assumed they will need total replacement.

3.9 Wilderness Study Areas

The Rush Fire consumed approximately 120,788 acres within lands designated as Wilderness Study Areas (WSAs). Six WSAs managed by the BLM were impacted, half of which were exposed entirely to the fire.

Complete (100%) **WSA Fire Exposure:**

Skedaddle (CA-020-612): 58,615 acres

Five Springs (CA-020-609): 48,898 acres

Bitterbrush (CA-020-604): 648 acres

Partial WSA Fire Exposure:

Twin Peaks (CA-020-619A): 34% burned; 30,671 acres

Dry Valley (CA-020-609): 21% burned: 20,123 acres

Buffalo Hills (CA-020-619): 28% burned; 10,731 acres

The BLM is required to protect the wilderness values of a WSA until such time as Congress acts to designate part or all of the WSA as Wilderness, or to release the WSA back to multiple use management. In the interim, the BLM manages these areas under the Wilderness Study Area Manual 6330. This policy includes direction for various activities and uses that can be allowed within WSAs, provided those uses and activities do not impair the WSA's suitability for designation as Wilderness.

Data from field observations during the fire, as well as during post-fire assessment was collected and evaluated. It was determined that impairment to the listed WSAs has occurred as a result of both natural fire processes and fire suppression activity.

Impairment from Fire Disturbance

Due to the extent of the Rush Fire, widespread resource disturbance occurred on the burn area, which has led to diminished environmental stability, ecologic function, and WSA character. Ongoing impacts may include loss of vegetative composition and additional introduction of invasive weeds. The burned areas suffered significant environmental loss, including substantial reductions in priority year-round sage-grouse habitat which is also crucial to the sustainability of mule deer and pronghorn populations.

The loss of vegetative cover has created increased resource risk due to the openness of the physical landscape. Prior to the Rush fire, a dense brush component and large rocks hidden by vegetation were an effective means of keeping ATVs and other vehicles used by the public on designated routes. Areas normally inaccessible to motor vehicles due to thick vegetation are now easily traversable due to heavy wildland fire damage. Uncontrolled cross-country motor vehicle travel may increase due to the reduction in visual and physical barriers. There is an increased risk that adverse human-caused impacts will result to wilderness character due to unauthorized travel. Damage to wilderness character may require rehabilitation treatments and increased costs to manage the WSA. Additionally, diminished wilderness character may impair WSA eligibility for future wilderness designation by Congress as discussed in the 6330 Wilderness Study Area Manual.

Impairment from Suppression Activity

Due to the size, severity, rate of spread and resource limits during the suppression of the Rush Fire, the decision was made to permit operation of heavy equipment (e.g. bull dozers) within WSAs in order to support fire management objectives. Although the equipment was effective, not all of the repair work done on containment lines was successful. Numerous lines were burned over, which led to both an exaggerated disturbance due to the denuded landscape and additional containment lines within a relatively small area. Although all containment lines were partially repaired, additional restoration needs to occur to eliminate risk to WSA characteristics and resource values.

WSA Restoration/ Repair Outlook

It is unlikely that the Wilderness Study Areas affected by the Rush Fire will stabilize and restore naturally to their pre-fire condition. Due to the severity of the disturbance, existing native seed sources are no longer available across much of the fire area. This, in combination with the threat of invasive species, makes environmental stability and the progression to a functioning ecological state unlikely. Active restoration (e.g. seeding, drill seeding, weed control treatments) is the preferred alternative to loss of historic function and Wilderness Character. This management goal is supported by Wilderness Study Area Manual 6330, exceptions to non-impairment 1.6.C.2 parts c and f.

*c. **Restoration of impacts from violations and emergencies**.*
Human-caused impacts from violations and emergencies will be restored as soon as possible after they occur. All restoration should be to a level as close as possible to, or better than, that which existed at the site prior to the disturbance.

*f. **Protect or enhance wilderness characteristics or values**.*
As described in section 1.6.A.2 of this manual, Section 2(c) of the Wilderness Act of 1964 outlines the characteristics required of every wilderness. Actions that clearly benefit a WSA by protecting or enhancing these characteristics are allowable even if they are impairing, though they must still be carried out in the manner that is least disturbing to the site.

3.10 Wild Horses and Burros

This environmental assessment is tiered to the Environmental Assessment (EA) for the *Twin Peaks Herd Management Area Wild Horse and Burro Gather Plan* (DOI-BLM-CA-N050-2010-05-EA), July 2010 and the Environmental Assessment (EA) for the *Buckhorn and Coppersmith Herd Management Areas Wild Horse Population Management Plan*, (DOI-BLM-CA-N050-2012-50-EA), August 2012.

The Twin Peaks HMA consists of 789,852 acres in northeast California and northwest Nevada. The Rush Fire burned 307,718 acres within the HMA, which is 39% of the total acres. The Buckhorn HMA consists of 85,938 acres, and the Rush Fire burned 9% or 7,860 acres of prime habitat for wild horses and wildlife within this HMA.

Overall vegetation burn severity inside the fire perimeter is 85-95%, with most individual forage plants completely consumed. Due to the extreme loss of forage, wild horses and burros are undergoing a detrimental loss of body condition, and are stressed due to the need to travel long distances to obtain forage and water. The lack of basic food and water resources is considered critical to the survival of these horses and burros, especially going into the winter months. Severe drought conditions have also greatly compounded the effects of the Rush Fire on native vegetation and forage and water resources. The Bull Flat weather station recorded an average annual precipitation of 6.6 inches over the previous 11 years, and in 2012 recorded 4.5 inches of precipitation from the beginning of the water year (October 1, 2011) until the fire started in August. In the months of May through August, 2012, only 0.3 inch of precipitation was recorded, for a total of 4.8 inches.

The BLM has estimated that native grass production grew only 20 to 30% of normal in 2012 at low elevations, and only 40 to 50% of normal production at mid to high elevations grew (Wilson, 2012). These conditions have substantially reduced the forage availability for wild horses and burros in the HMAs pre-fire, and continue to affect forage growth in unburned areas of the HMAs. In addition, approximately 50% of the developed pits and reservoirs that usually contain water into the fall were dry by early to mid-summer in 2012 (Farris, 2012). Many riparian and spring sites experienced higher use levels from livestock, wild horses, and wildlife pre-fire due to water shortage in adjacent areas.

Due to the loss of forage due to wildfire and drought, the original appropriate management level for the Twin Peaks HMA is no longer valid, and the HMA can no longer support this level of

wild horses and burros. All of the division fences within and between the two HMAs have been partially or totally destroyed by the fire, so the horses and burros can now move freely within and between the two HMAs. This has created very large populations in the unburned portions of the HMAs.

The BLM direct count aerial population inventory during the week of September 17, 2012 showed that a total of 983 wild horses, 275 burros, and 38 mules are currently within the Twin Peaks HMA, and 138 wild horses are currently within the Buckhorn HMA, distributed as shown on Map 1. There are 956 horses and 162 burros residing within the Rush Fire burned area, and within a 5-mile buffer of the fire perimeter, where there are extremely limited forage and water resources. The health of these wild horses and burros is being severely affected by the lack of available forage and water.

Land Health

A high percentage of the normal vegetation production in the HMAs has been completely consumed by wildfire and to a lesser extent by grazing (pre-fire), and adequate vegetation cover is non-existent in many areas of the HMAs. Photos 1-8 show the damage to native vegetation caused by the wildfire and drought conditions. Within the large expanses of burned areas, the only green vegetation remaining is in small riparian/wetland sites. There are small unburned pockets of vegetation where the only standing vegetation is from annual grasses (cheatgrass and medusahead) and western juniper trees.

The BLM has planned emergency stabilization seedings on approximately 47,000 acres to aid in plant recovery and watershed stability. In areas that have been mapped as low soil burn severity, native grasses and forbs are expected to recover naturally to some extent, however due to the extreme drought conditions, natural recovery may not occur successfully for several years. Native plants (including seedings) will be additionally stressed if wild horse grazing is allowed to continue, making plant communities unable to function to prevent erosion and provide an adequate level of forage and cover for wildlife.

Wildlife Habitat

The Rush Fire burned lands that contain significant habitat for many wildlife species, including the greater sage-grouse, a Federal Candidate species, and a BLM Sensitive Species; mule deer, a locally important game species, and pronghorn antelope, also a locally important game species. Removal of wild horses and burros within these important wildlife habitat areas that have been burned will promote the regrowth of vegetation and recovery of springs and other water sources. Combined with rest from livestock grazing and protective fencing, a gather of wild horses and burros will serve to maximize opportunities for reestablishment of vegetation and water sources within the affected fire perimeter area. These actions are considered essential to allow for recovery of priority or important wildlife habitat.

Photo 1. In the burned area, wild horses are concentrating on riparian areas. Location is southeast corner of South Observation home range near Smoke Creek Ranch.

Photo 2. Forage is sparse due to the wildfire and ongoing drought in the Skedaddle home range.

Photo 3. Riparian and meadow areas provide the only water and forage amidst large burned areas. Location is Harrison Springs in North Observation home range.

Photo 4. A small riparian area within a large expanse of the fire in the North Twin Peaks home range.

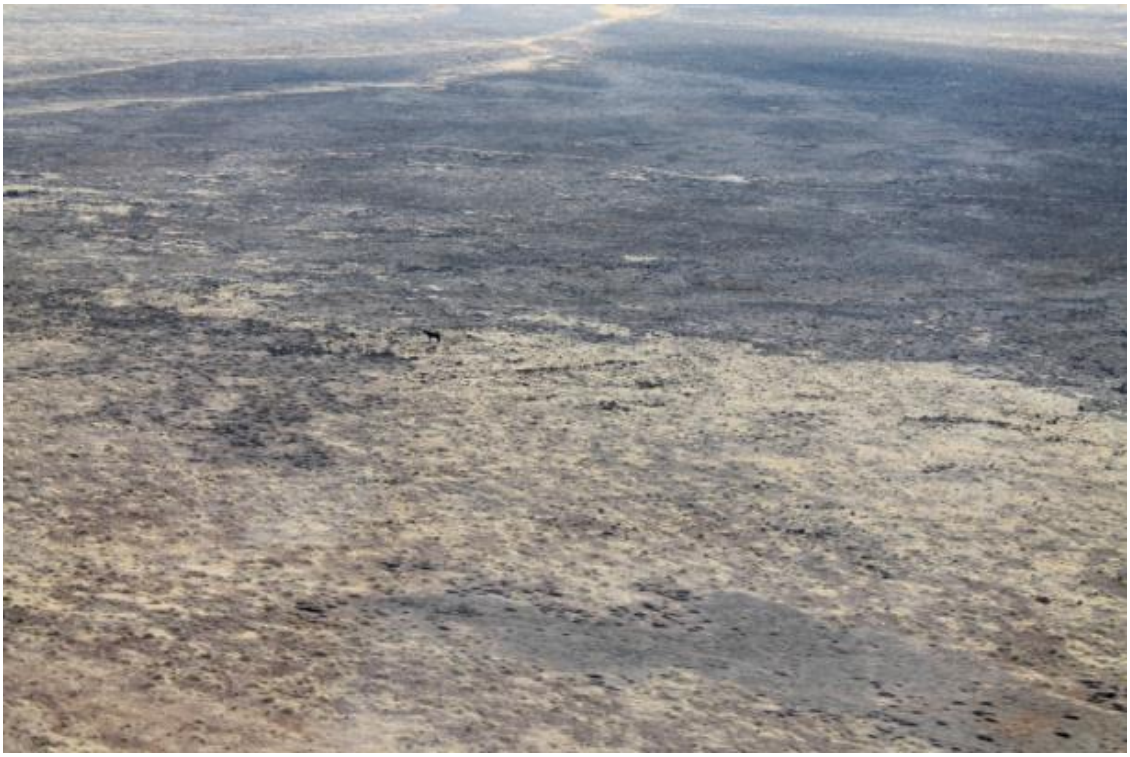


Photo 5. A few unburned islands offer the only sparse forage for wild horses and burros in the Dry Valley Rim home range.

Photo 6. A small riparian area near the boundary of a burned and unburned area. Location is Five Springs Mountain in Skedaddle home range.

3.11 Livestock Grazing

Livestock grazing within the Rush Fire Perimeter is typically managed for cattle and sheep within nine separate grazing allotments. The wildfire severely impacted vegetation and has reduced available forage resources within each of these allotments as shown in Table 3.11.1 below.

Table 3.11.1 Livestock Grazing Allotments within the Rush Fire Perimeter

Livestock Grazing Allotment Name	Size (acres)	Area (%) Burned by Rush Fire
Twin Peaks	408,894	35% - Northeast portion of the allotment not burned
Observation	244,000	50% - Observation North Pasture only partially affected by the fire
Deep Cut	63,450	41% - South Pasture not burned
Winter Range California	12,000	92%
Spanish Springs AMP	7,806	99%
Shinn Peak IND	4,674	100%
Twin Buttes	2,480	65%
Spanish Springs Ind.	1,845	97%
Tuledad	320,800	5%

Livestock would be excluded from the burned areas of the Rush Fire until monitoring results documented in writing, show emergency stabilization and rehabilitation objectives have been met. Following is a summary of the allotments planned for full or partial closures as a result of the fire.

Twin Peaks: Thirty-five percent of the allotment burned affecting two authorized grazing permits. The northeast portion of the allotment will remain open for grazing pending the installation of a temporary pasture division fence proposed in this plan.

Observation: Fifty percent of the allotment burned affecting four authorized grazing permits. Livestock will be excluded from the entire allotment.

Deep Cut: Forty-one percent of the allotment burned affecting two authorized grazing permits. The South Pasture was not affected by the fire and will remain open to grazing according to management guidelines set forth in the Deep Cut AMP. Livestock will be excluded from the middle and north pastures.

Winter Range CA: Ninety-two percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Spanish Spring AMP: Ninety-nine percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Shinn Peak IND: One-hundred percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Twin Buttes: Sixty-five percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Spanish Spring IND: Ninety-seven percent of the allotment burned affecting one authorized grazing permit. Livestock will be excluded from the entire allotment.

Tuledad: Five percent of the allotment burned affecting seven authorized grazing permits. Livestock will continue to be authorized on the allotment pending the construction of a temporary pasture division fence. Livestock will be excluded from the burned portion of the allotment.

It generally takes 2 years or longer to successfully establish a new seeding, especially when establishing native plants in an arid environment. During years of below normal precipitation or drought, longer rest periods from livestock grazing may be needed to meet the goals and objectives. It is extremely important to allow re-sprouting vegetation to recover and newly seeded species to become firmly established.

Within burned areas of the allotments, vegetation burn severity is high, with 80-95 percent of all grasses, forbs, and shrubs being completely or partially consumed by the fire. The purpose of livestock grazing closures is to:

1. Allow natural recovery of plants that will recover on their own to occur (from regrowth or sprouting), without the added pressure and stress of defoliation from livestock grazing.
2. Allow the germination and initial growth of seeded plants to occur without ground disturbance from livestock hoof action and trailing.
3. Allow seeded plants to establish for at least two years so they are adequately rooted in the soil, to avoid them from being physically pulled out of the soil from livestock grazing.
4. Allow seeded plants to grow into mature plants with sufficient leaf growth for photosynthesis and the ability to produce seed before they are grazed.
5. Allow riparian areas and wetlands, which are highly preferred grazing areas, to rest from livestock grazing pressure to allow for full recovery of riparian plant growth and vigor to ensure the proper functioning of riparian/wetland sites.
6. Allow native plants to recover from wildfire through regrowth and sprouting to provide food, cover, and shelter to wildlife, especially in mule deer, pronghorn, and greater sage-grouse habitats.

The Emergency Stabilization and Rehabilitation Plans for the Rush Fire state that resumption of livestock grazing could occur when the following objectives have been met for uplands and in transition zones between riparian/wetland sites in uplands:

1) **51% or more of native perennial grasses are producing seed**. Methodology: A seed head count is conducted on key grass species with a minimum of 50 points along a transect. The seed head counts will be conducted after the growing season to accurately represent whether desired native perennial grasses are producing seed heads.

2) **Total canopy cover is sufficient to provide for soil stabilization and site functionality. Greater than 70% canopy cover is present for the rangeland ecological site when compared to a control area that is in a similar unburned ecological condition.** Methodology: A Line Point Intercept (Cover) transect is conducted within the monitoring site, with a minimum total of 50 points. The procedure is designed to estimate the cover of plant species within the site. The transect measures the cover of plant species (perennial and annual), along with the percent cover of bare ground, rock, biological crust, and litter (standing and ground).

3) **For areas seeded with a grass mixture there will be a minimum density of three perennial grass plants per meter^{2}.** Methodology: One-half meter square density plots are used to read plant density at ten plots along each transect for a total of thirty plots. This is then extrapolated to provide the plant density by species per square meter, which is an indicator of seeding success and recovery.

4) **Root systems of seeded grasses are sufficient to provide soil stabilization and are capable of withstanding livestock grazing. 90% of seeded grasses must have developed root and shoot systems extensive enough to prevent plants from being physically "pulled" from the ground by livestock grazing.** Methodology: Within seeded areas, grass pulls are conducted on seeded perennial grass species with a minimum of 50 pulls per key seeded species.

Pre-Fire Livestock Management

Recent decisions pertaining to the nine grazing allotments are contained in the following documents:

1. BLM Environmental Assessment, CA-350-2008-04, *Observation Allotment 10 Year Grazing Authorization, 2009*
2. BLM Environmental Assessment, CA-350-2008-05**,** *Winter Range Allotment 10 Year Grazing Authorization, 2008*
3. BLM Environmental Assessment, CA-350-2004-09, *Grazing Permit Renewals for the Spanish Springs Allotment Complex (Shinn Peak, Spanish Springs AMP, Spanish Springs Individual, Twin Buttes Allotments), 2004*
4. BLM Environmental Assessment, CA-350-2002-19, *10 Year Grazing Authorization on the Deep Cut Allotment*, 2002
5. BLM Decision Record, *Notice of Final Multiple Use Decision for the Twin Peaks Allotment, January 2001*
6. BLM Environmental Assessment, CA-350-2000-15, *Implementation of Management Actions for the Twin Peaks Allotment, 2000*

7. BLM Decision Record, *Notice of Final Multiple Use Decision for the Observation Allotment,* August 1998
8. BLM Environmental Impact Statement, *Proposed Livestock Grazing Management for the Cal-Neva Planning Unit, Final Environmental Impact Statement,* 1982

Livestock grazing use is controlled with fencing, herding, and strategic placement of water. Rest-rotation grazing and/or deferred rotational grazing is also employed. Under rest rotation grazing, a pasture is grazed for one season, and then is rested for one or two growing seasons to allow sufficient recovery time for plant growth, prior to being grazed again. Deferred grazing involves postponing grazing on a pasture until a specific period of time, for example, when plants mature and reach seed set, and they are not as vulnerable to damage from grazing, as they would be during spring growth. Other grazing strategies include early-on and early-off grazing, altering turnout locations, delayed turnout, or a modified annual season-of-use. Annual adjustments to livestock grazing are made by the BLM according to forage availability, and in response to drought conditions or above-average precipitation.

Tables 3.11.2 and 3.11.3 below list the number of animals and animal unit months that are permitted in each grazing allotment for cattle and sheep, along with the permitted season of use, and the type of grazing system employed. These permitted numbers would be used for livestock grazing in the next two years in areas that did not burn.

Table 3.11.2 Cattle Grazing Summary Pre-Burn

Livestock Grazing Allotment Name	No. of Cattle Permits	Cattle (No.)	Active Cattle AUMs	Season of Use (Dates)	Grazing System
Twin Peaks	2	1,094	10,580	04/1-1/31	8 Pasture Deferred Rotation; Use Restrictions in Deer Concentration Areas; Riparian Restrictions
Observation	3	923	6,010	4/15-10/31	3 Pasture Deferred Rotation
Deep Cut	2	978	2,405	4/1-6/15	3 Pasture Rest Rotation/ Riparian Restrictions
Spanish Springs AMP	2	300	1,513	5/16–7/15[1/] or 7/16-10-31	3 Pastures Deferred - Summer
Twin Buttes	2	52	210	5/01-8/31[1/] or 7/01-10/31	1 Pasture Deferred - Summer
Spanish Springs Ind.	1	73	259	5/01-8/31[1/] or 7/01-10/15	1 Pasture Deferred - Summer
Tuledad	7	1,412	7156	04/01 – 09/30	2 Pasture Deferred

[1/] These dates reflect a change in grazing season every other year; both periods are not used in one single year.

Table 3.11.3 Domestic Sheep Grazing Summary Pre-Burn

Livestock Grazing Allotment Name	No. of Sheep Permits	Sheep (No.)	Active Sheep AUMs	Season of Use (Dates)	Grazing System
Twin Peaks	1	4,000	2,850	4-1/5-30, 6/01-6/30, 9/16-9/30, 10/01-10/25	Multiple, Short Seasons, Herder
Observation	1	4,000	958	6/0-7/15; 9/1-9/30	Multiple, Short Seasons, Herder
Winter Range CA	1	1,000	617	3/1-4/30	1 Pasture, Short Season, Herder
Shinn Peak	1	1,000	272	6/01-7/11	1 Pasture, Short Season, Herder
Tuledad	7	4,000	2354	03/26 – 06/30; 09/20 – 10/15	Lambing in the spring; Trail through summer ranges, removed by mid-July. Trailed back during September and early October.

3.12 Recreation Facilities and Human Safety

The BLM lands burned by the Rush Fire are used extensively for recreation by the public. Common recreation activities include hunting, ATV and motorcycle riding, hiking, horseback riding, and wildlife observation. Other activities that occur with low frequency are wild horse observation, nature study, and archaeological sightseeing. Visitors to public lands are required to keep vehicles on designated routes to avoid off-road travel damage to soils, vegetation, and cultural resources. The BLM posts informational signs at key locations to help visitors stay on these designated routes, and to help them know where they are at all times in case of emergency. The Rush Fire burned and destroyed 14 public information signs that need to be replaced to assist with visitor safety.

The Rush Fire burned many trees along designated travel routes. The BLM has identified approximately 40 burnt trees adjacent to Buckhorn Backcountry Byway and Rye Patch Road that have been identified to be hazardous to human safety as these are frequently traveled access roads. These areas contain trees that are unstable due to fire damage and my fall on the road due to high winds or erosion.

The treatments would ensure human safety along identified roads during any human activities. The complete removal of hazardous trees from identified roadsides will eliminate the human life and safety hazard. Certified sawyers would cut and buck hazardous trees, while other crew members would carry the materials to a safe distance of at least 20 feet away from the road.

4.0 ENVIRONMENTAL CONSEQUENCES

This section describes the environmental consequences of implementing either Alternative A or Alternative B (as described in Section 2.0) on resources affected by the Rush Fire. This section describes the Direct and Indirect Effects, and Cumulative Effects for all resources that may be impacted from the alternatives.

The alternatives are analyzed for the environmental consequences of implementing or not implementing Emergency Stabilization and Rehabilitation Treatments that would be applied to a post-fire landscape. This analysis of effects is based on the premise that all standard operating procedures found in the Appendices, and other BLM requirements will be followed during the implementation of the Proposed Action. Design features that are intended to avoid or minimize environmental harm and have been incorporated into Alternative A and are treated as an inherent part of the Proposed Action. The assessment of environmental consequences is tiered to the Eagle Lake RMP/EIS, 2008. The analysis is based on the best available information.

Emergency Stabilization and Rehabilitation Treatments Categories

Emergency Stabilization and Rehabilitation treatments analyzed in this EA are organized and grouped under the following categories:

1) Erosion Control and Vegetation Restoration,

2) Riparian/Wetland Stabilization,

3) Wildlife Habitat Improvement,

4) Cultural Site Protection, and

5) Recreation and Human Safety Treatments.

The individual treatments of the Proposed Action that make up each category are listed below:

1. Erosion Control and Vegetation Restoration Treatments:

- Drill Seeding on 5,000 acres
- Aerial Seeding on 26,000 acres
- Hand Planting on 2,200 acres
- Invasive Plant Control on 250 acres
- Travel Restrictions on 26 routes
- Temporary Livestock Grazing Exclusion on nine allotments
- Reduction in Wild Horse and Burro Grazing in the Twin Peaks and Buckhorn HMAs

2. Riparian/Wetland Stabilization:

- Hand Planting of Shrubs on Stony Creek and Upper Smoke Creek
- Erosion Stabilization on 1,800 feet of stream channel
- Restoration of Meadow Vegetation on 300 acres through seeding and rest from grazing

- Construction of New Permanent Fenced Grazing Exclosures on nine springs
- Repair Fenced Grazing Exclosures on 33 springs and riparian sites
- Exclusion of Livestock Grazing on burned allotments until Riparian/Wetland plants have recovered and met monitoring objectives
- Reduction in Wild Horse and Burro Grazing in the Twin Peaks and Buckhorn HMAs

3. Cultural Site Protection:

- Hazard Tree Removal on 60 acres adjacent to Backcountry Byway
- Hazard Tree Removal on six cultural sites
- Site Stabilization Measures on five cultural sites

4. Wildlife Habitat Improvement:

- Drill Seeding on 5,000 acres
- Aerial Seeding on 26,000 acres
- Hand Planting on 2,200 acres
- Replace/Repair 10 Wildlife Guzzlers
- Cleanout of 100 Water Catchments

5. Recreation and Human Safety Treatments:

- Hazard Tree Removal on 60 acres
- Replace/Repair 14 Informational road signs

Analysis of Cumulative Effects

For the purposes of analyzing cumulative impacts on all affected resources, the following list describes the past, present, and reasonably foreseeable relevant actions within the Rush Fire perimeter. The cumulative impacts study area for the purpose of evaluating cumulative impacts is the Rush Fire perimeter, except for the following resources: for wild horses and burros it is the boundaries of the Twin Peaks and Buckhorn HMAs; for livestock grazing it is the entire nine grazing allotments affected by the fire; and for greater sage-grouse it is the Buffalo-Skedaddle Population Management Unit boundary.

***Past Relevant Actions*:**

1. Livestock have used this area for grazing for at least 60 years. Prior to 1979 there was a large amount of willful trespass livestock grazing that contributed to the degradation of upland and wetland plant communities.
2. Over the past 40 years the BLM has reduced the amount of livestock grazing in the area by approximately 60% (including the numbers reduced from the stop of willful trespass). Livestock grazing management has been modified to reduce or eliminate impacts to vegetation and cultural sites though coordination with the grazing permittees.
3. Wild horses and burros have used the area historically. In years that the populations of wild

horses and burros have exceeded the established AML range, disturbance to vegetation and to cultural resource sites has occurred in some areas.

4. Since 1976 the BLM has conducted approximately 25 gathers of wild horses and burros throughout the area in order to remove excess animals to manage the population size within the established AML ranges. The excess animals removed have been transported to short-term corral facilities where they were prepared for adoption, sale (with limitations), long-term pasture, or other statutorily authorized disposition.
5. The last gather conducted on the Twin Peaks HMA was in August and September 2010. The BLM captured 1,637 wild horses and removed 1,579 from the range. A total of 160 wild burros were captured and removed. The BLM completed a post-gather count of 793 wild horses and 160 burros in the Twin Peaks HMA. The appropriate management levels for the HMA are 448-758 wild horses and 72-116 wild burros.
6. Over 30 wildfires are known to have occurred within the area which have influenced native vegetation, and potentially affected cultural resources.
7. Several important vegetation communities, riparian/wetland areas, or cultural resource sites, such have been fenced or partially fenced from livestock grazing and from wild horse and burro use. These include the Pine Dunes ACEC, Upper and Lower Smoke Creek, Rodeo Flat, and several springs.
8. The BLM has conducted Integrated Weed Management for the past 20 years to monitor and treat infestations of noxious weeds and invasive species.
9. Some areas have been impacted by off-highway vehicle use that has occurred off of established roads and trails. The Eagle lake RMP, 2008 has limited all off-highway vehicle use to designated trails.
10. Recreation use has occurred mainly in the form of wilderness recreation, hiking, camping, and hunting. Activities that have occurred with very low frequency are wildlife observation, nature study, and archaeological sightseeing.

Present and Reasonably Foreseeable Relevant Actions Not Part of the Proposed Action

1. Over the next 10-20 year period, reasonably foreseeable future actions include gathers of wild horses and burros about every three years, in order to remove excess animals to manage the population size within the established AML ranges. The excess animals removed would be transported to short-term corral facilities where they would be prepared for adoption, sale (with limitations), long-term pasture, or other statutorily authorized disposition.
2. Livestock grazing would continue after the post-fire monitoring objectives for each allotment have been met. The BLM would continue to authorize permits that require livestock to be grazed under specific terms and conditions that are designed to achieve, or make significant progress towards achieving Land Health Standards.
3. The Eagle Lake Field Office is developing proposed management actions to protect the greater sage-grouse from habitat degradation through a multi-state BLM effort. These management actions will be included in BLM Resource Management Plan Amendments for Sage-grouse due to be completed in 2014. In the meantime the Eagle Lake Field Office has

mapped out Priority and General Habitat for sage-grouse within the field office boundaries, and is following Interim Management Measures as outlined in Instruction Memorandum No. 2012-043 for any projects to be completed before the RMP Amendments are finalized.

Sage-grouse lek (breeding ground) counts will continue, to assist in contributing to population data, and to monitor habitat conditions. In addition, telemetry studies are planned to track sage-grouse movements and use of the fire area and surrounding intact habitat.

4. It is predicted that additional wildfires will occur in the future, and the lands affected may have emergency stabilization or rehabilitation efforts implemented on them.
5. Approximately 15 riparian/wetland areas are planned to be fenced in the Observation Allotment to protect vegetation and cultural resources from grazing and trampling damage by livestock and wild horses.
6. The BLM will continue to monitor and treat infestations of noxious weeds and invasive species using Integrated Weed Management.

4.1 Effects on Areas of Critical Environmental Concern

The Pine Dunes ACEC and the Buffalo Creek Canyons ACEC were only slightly damaged by the Rush Fire. The Lower Smoke Creek ACEC and the North Dry Valley ACEC were not damaged by the Rush Fire so they are not addressed in this section. In addition, the Pine Dunes and Lower Smoke Creek ACECs were fenced from all large grazing animals prior to the fire, however, some of these fences have been damaged, and may not be functioning without repair.

4.1.1 Effects of Alternative A (Proposed Action) on Areas of Critical Environmental Concern

Only a small percentage of the Pine Dunes and the Buffalo Creek Canyons ACECs were impacted by the Rush Fire, hence the only *Erosion Control and Vegetation Restoration Treatments* planned include Temporary Livestock Grazing Exclusion, Fence Repair, and a Reduction in Wild Horse and Burro Grazing. The Buffalo Creek Canyons ACEC contains unique cultural, biological, and geological values, fish and wildlife resources, and scenic values. Several important riparian areas exist in this ACEC that are important to wildlife, and are significant as archaeological sites. The grazing reduction treatments would have a beneficial impact to the burned areas by reducing damage to cultural resources, as well as upland and riparian vegetation within the ACEC. The Pine Dunes ACEC would also benefit from the repair of existing fences and grazing reductions to allow native vegetation to recover post-fire.

4.1.2 Effects of Alternative B (No Action) on Areas of Critical Environmental Concern

Without the *Erosion Control and Vegetation Restoration Treatments* of repairing fences and reduced grazing, important cultural and biological resources within these ACECs would undergo adverse impacts such as overgrazing, trampling damage and displacement to some of the unique cultural sites. Impacts would also continue to degrade several important riparian areas that are important to wildlife and are significant as archaeological sites. See additional

information on effects to unique ACEC resources in Section 4.2 Cultural Resources, 4.4 Riparian/Wetland Sites, and Section 4.6 Wildlife Habitat.

4.1.3 Cumulative Effects to Areas of Critical Environmental Concern

The Proposed Action would not result in any cumulative effects to ACECs.

Cumulative impacts from Alternative B would be increased damage to vegetation and cultural resources within the ACECs. Vegetation communities that have experienced past damage from overgrazing by livestock and wild horses, and contain a low percentage of native perennial grasses, would continue to be degraded to the point that they may cross an ecological threshold to sites dominated by invasives and annual grasses. The continued overuse of riparian sites and wetlands would result in an ever increasing impact to cultural resources, and several sites would be damaged or destroyed through trampling, rolling, and wallowing (creating a sunken area in the ground made by a rolling animal).

4.2 Effects on Cultural Resources

4.2.1 Effects of Alternative A (Proposed Action) on Cultural Resources

The Proposed Action is designed to reduce post-fire effects to historic, prehistoric, and traditional cultural properties by stabilizing sites where needed, use of law enforcement, and providing compliance for areas proposed for treatments. Surveys will be completed ahead of any ground disturbing treatments. The areas designated for drill-seeding will be fully inventoried at a Class III level prior to ground disturbing activities. Portions of the lands designated for drill seeding are also located along streams and near springs where significant cultural resources are likely to occur. Because all significant cultural resources will be flagged for avoidance prior to earth disturbing activities, no adverse effects to archeological resources are anticipated under this alternative.

The Proposed Action would have direct and indirect beneficial effects on cultural resources. With proper design, installation, and maintenance of treatments, the amount of short-term adverse impacts would be small and temporary, and would more than be offset by long-term benefits of these treatments. Utilizing the expertise and supervision of a cultural specialist during *Cultural Site Protection Treatments* would prevent harmful effects to cultural resources. Proposed inventories would protect cultural resources during ground disturbing treatments such as seedbed preparation, seeding, and fencing to the extent practicable under the National Historic Preservation Act 1966, as amended. If significant resources are identified, then either avoid the sites or, if avoidance is not possible, mitigate the adverse effects by consulting with the State Historic Preservation Officer (SHPO).

Erosion Control and Vegetation Restoration Treatments would benefit cultural resources by preventing additional exposure of cultural resources by camouflaging an area with revegetation and spreading of slash and debris. Seeding and planting would reduce soil movement around and onto cultural resources following the wildfire. Direct effects from

seeding and planting and cultural site treatments include promoting revegetation and preventing additional degradation or loss of cultural resources due to exposure and/or access.

Hazard tree removal from six cultural sites would ensure that significant and non-renewable heritage values at risk will not be compromised by the falling of stems or uplifting of roots of standing dead or dying trees burnt during the fire. These treatments will result in beneficial effects to cultural resources through the protection of petroglyph panels and rock ring features.

Cultural Site Protection Treatments would protect significant cultural resources that could be damaged through increased visitation and potential looting and vandalism at the Tommy Tucker Cave. The treatments planned at Indian Springs and Deep Creek will accelerate and encourage re-vegetation; preserve soils through slowing and re-directing post-fire flows, while discouraging wind erosion; and restrict on-site vehicular and foot traffic. These treatments will ensure that significant and non-renewable cultural resource values at risk will not be compromised by post-fire watershed events that could result in increased flows and consequently, significant erosion. *Cultural Site Protection Treatments* would protect and preserve historical properties damaged by fire in the long-term. Any structural stabilization and rehabilitation of historical properties would be done under direction and supervision of cultural resource specialists.

The Proposed Action would also result in a decrease in disturbance to cultural resources by reducing the numbers of wild horses and burros within the area, and closing burned areas to livestock until vegetation objectives have been met. Impacts to cultural sites from trampling and displacement by hoof action and deflation caused by 'rolling' would be reduced. Impacts to springs and riparian cultural sites would be also reduced significantly beginning the first year following these reductions in grazing. Indirect impacts to cultural resources would be reduced in riparian zones where concentrations of livestock and/or wild horses can lead to modification and displacement of artifacts and features, as well as erosion of organic middens containing valuable information. Vegetation cover would improve, and cultural resource sites would be afforded more protection.

The Proposed Action would implement a temporary travel restriction on 76 designated routes within WSAs in order to prevent erosion and sedimentation within the burned area, and to protect cultural resources from vehicle damage.

Under the Proposed Action, no additional impacts to cultural resources beyond those experienced on a daily basis, are expected as a result of implementing proposed treatments. The potential locations identified for use as capture sites and holding areas for wild horses would be inventoried for cultural resources prior to use. Any capture location that includes cultural resources will be evaluated to determine if use of that location will be permitted.

4.2.2 Effects of Alternative B (No Action) on Cultural Resources

Under the No Action Alternative the BLM would not implement *Erosion Control and Vegetation Restoration Treatments* or *Cultural Site Protection Treatments*, which would result in adverse impacts to cultural resources. Sites that have been exposed to view by the

fire could be damaged through increased visitation, on-site vehicular and foot traffic, and potential looting and vandalism.

The Rush Fire has completely removed the vegetation adjacent to some cultural sites. Without seeding and stabilization treatments, these sites would be susceptible to increased wind and water erosion. Hazard trees exist near some important sites that would continue to be at risk from falling stems or uplifting roots of standing dead or dying trees burnt during the fire. Damages could occur to petroglyph panels and rock ring features.

Without any livestock closures or reductions in wild horse grazing, excessive grazing of burned uplands and riparian/wetland sites would occur, and this combined with past actions of wildfire and historic heavy livestock grazing, would likely cause some plant communities to become degraded to the point of crossing an ecological threshold, with a limited amount of plant litter and cover, thereby affording little to no protection to cultural sites. Small riparian sites would likely become nonfunctional and dry up, with a high amount of damage to cultural resources through breakage, displacement, and loss of site integrity.

Impacts to water sources and riparian areas would continue and increase, which would allow further adverse impacts to cultural sites in the vicinity of the water sources. Overgrazing of burned upland and riparian/wetland areas where cultural resources are located would continue to be in danger of complete destruction as the vegetation cover is reduced and removed.

4.2.3 Cumulative Impacts to Cultural Resources

The Proposed Action is not expected to result in cumulative effects to cultural resources. Grazing by livestock and wild horses has probably affected a larger number of sites than is documented. By removing or reducing livestock and excess wild horses and burros as described in the Proposed Action, vegetation health and cover will improve, trampling, rolling and wallowing by animals will be reduced, and protection to cultural resources will be improved.

Cumulative impacts from Alternative B would result from the lack of vegetative cover on sites, increased looting and vandalism, and destruction of artifacts by grazing and unauthorized vehicle use. Since many Great Basin prehistoric sites are on the surface or near surface sites, any ground disturbing activities destroy site integrity, spatial patterning, and site function. Datable organic features are either destroyed or contaminated. Previous activities within the Rush Fire perimeter including localized grazing from livestock and wild horses, development of range improvements, road construction/maintenance, prescribed, natural, and human caused fire have caused these types of impacts to cultural resources.

4.3 Effects on Soils, Watersheds, and Hydrology

4.3.1 Effects of Alternative A (Proposed Action) on Soils, Watersheds, and Hydrology

Soil and watershed stabilization following wildland fire would be enhanced by successful

reestablishment of native plants through seeding, and where natural revegetation is adequate to protect soil surfaces. Implementation of the treatments would speed up the revegetation process through seeding and rest from livestock grazing for a minimum of two growing seasons. Successful revegetation would facilitate soil stabilization of exposed burned soils. Revegetation efforts would provide indirect beneficial effects on soils by providing cover and root structure from seedings which would minimize soil loss through wind and water erosion.

Depending on fire intensity, some of the burned area soil has been exposed and prone to wind and water erosion. If surface runoff occurs before ground cover becomes re-established, erosion would occur. *Erosion Control and Vegetation Restoration Treatments* would be prescribed on a site-specific basis. Seeding methods have a low probability for reducing erosion the first year because most of the benefits of the seeding occur after germination and root development. Therefore, the benefits of seeding are considered to be long-term. Once the area is rehabilitated and ground cover becomes re-established, soil erosion would be similar to that of the pre-burn landscape.

Site and seedbed preparation, and seeding and planting treatments, could have short-term impacts to the remaining vegetation and to the soil surface, such as increasing the rate of wind erosion in sandy soils or sealing the soil surface in clay soils. Broadcast seeding would have less short-term soil impacts than other mechanical methods used to prepare soil for seeding. Site and seedbed preparation methods exposing the soil surface, would have the highest short-term impacts. Despite a variety of potential soil impacts from mechanical treatments, the long-term benefits from re-establishing perennial vegetation would quickly out-weigh the short-term disturbances because revegetation would provide long-term soil and water quality protection.

Some minor soil compaction may occur along fences as a result of vehicular traffic involved in fence construction and repair activities to facilitate grazing closures and livestock distribution once grazing is resumed. In addition, routine fence maintenance could also impact soils through compaction. Site preparation treatments involving soil disturbance such as drilling could also expose soils to short-term wind erosion prior to successful seedling establishment.

Invasive weed control treatments have long-term and short-term effects on soils. Manual removal of undesirable plant species, resulting in temporary loss of vegetation, could create a minimal increase of erosion in the short-term due to exposed soil surfaces. In addition, controlling annual grasses and establishing native or desirable non-native vegetation would result in more natural fire cycles that are burning at lower intensities. As a result fires would be less damaging to soil and produce less erosion in the long-term.

Riparian/Wetland Stabilization Treatments would result in long-term benefits from land and channel treatments designed to stabilize soil, minimize streambank erosion, protect adjacent meadow sites, and improve hydrologic stability. These treatments are expected to be successful in stabilizing the channel and aggrading the channel elevation, raising the water table in the area, and increasing the active revegetation. Furthermore, the project will restore dispersed flow, increase infiltration at every opportunity, and cultivate restorative plant communities to build soil.

The installation of *Recreation and Human Safety Treatments* would temporarily disturb the soil by digging post holes and removing trees. However, these treatments are designed to promote public health and safety in the long-term.

Removing livestock grazing until vegetation objectives have been met, along with reducing the populations of wild horses and burros would significantly reduce damage to soils resulting from trampling and overgrazing of vegetation. Prior to the fire, the Upland Soils Standard was being met for most assessment sites in all allotments, except for the Deep Cut Allotment. However there are many assessment sites that rated as "Moderate" for *Soil Stability*, *Litter Amount*, *Annual Production*, and *Invasive Species*, and a "Moderate to Extreme" rating for *Functional/ Structural Groups*. These sites have lost a large portion of the native perennial bunchgrasses that should be present at the site, resulting in an increase of smaller bunchgrasses such as Sandberg's bluegrass.

There are also several areas that have been invaded by cheatgrass and medusahead, and have lost their soil structure. These plant communities are very vulnerable to additional disturbance from the wildfire, and would benefit from a reduced amount of grazing, especially year-long grazing. Reducing the number of grazers would significantly benefit these sites, by preventing additional loss of cover and litter, and by reducing the amount of bare ground which makes sites susceptible to soil erosion.

4.3.2 Effects of Alternative B (No Action) on Soils, Watersheds, and Hydrology

The No Action Alternative would result in adverse, moderate short-term effect on soils with moderate to high soil burn severity from increased erosion. Moderate amounts of erosion are likely on steeper slopes that burned at moderate to high severity, although this is only a small amount of the total burn area. Soils that are highly susceptible to wind erosion will likely experience topsoil loss. Overall, the Rush Fire was mapped as predominantly low runoff potential with isolated areas of moderate runoff potential, corresponding with the mosaic of predominately unburned and low soil burn severity. The southern part of the Rush Fire contains more areas of moderate and high runoff potential, but still was predominantly a mosaic of unburned and low, also corresponding to the large amount of unburned and low soil burn severity. The primary watershed response of the Rush fire is expected to include: 1) an initial flush of ash and organic debris; and 2) small amounts of localized erosion and deposition in response to typical precipitation events.

Implementation of Alternative B would result in continued livestock grazing, and continued year-long use by wild horse and burros, which would increase the level of disturbance to vegetation and soils. High vegetative utilization levels (>60%) as a result of livestock grazing or wild horse use in areas with moderate to high soil burn severity can degrade these soils in both the short and long term through soil compaction, erosion, sedimentation, and degradation of stream channel conditions (Fleischner 1994).

4.3.3 Cumulative Effects to Soils, Watersheds, and Hydrology

The Proposed Action is not expected to result in cumulative effects to Soils, Watersheds, and Hydrology. Potential erosion has increased in the burned areas as a result of the fire, and the implementation of *Erosion Control and Vegetation Restoration Treatments* would help to reduce erosion on at least 25,000 acres.

Alternative B would result in cumulative impacts from increased soil erosion throughout the burned area and loss of riparian stabilization in the Stony Creek Watershed. The most significant erosion increases post-fire will occur in areas where soil burn severity was rated as moderate or severe, and where slopes are steep (greater than 35%). Within the Rush Fire Perimeter there are only a few areas that have these conditions, which are predominately in the mountain areas. The steep slopes and drainages within the north-facing slope of Skedaddle Mountain contain stored sediment with high potential for mobilization into surface erosion and debris flows if significant precipitation occurs over a short period of time.

The steeper slopes are 50 to 90% rock cover that will have high runoff but will remain as sheet flow across and around the rock cover. Lower gradient slopes have rock cover from 10 to 50% which will also have minimal increased erosion due to the fire. In all areas, ash flow (also known as black water), will occur during the first couple of rain events depending on rainfall intensity. The ash flows may carry woody debris and cobble-sized rock in the channels and onto the alluvial fans depending on the storm intensity and duration. There are no practical treatments for these initial ash flow events unless a high value at risk, such as life or real property, will be directly impacted.

4.4 Effects on Riparian/Wetland Sites and Water Quality

4.4.1 Effects of Alternative A (Proposed Action) on Riparian/Wetland Sites and Water Quality

Specific effects of *Erosion Control and Vegetation Restoration Treatments* on erosional factors influencing water quality, floodplains, wetlands, and riparian zones are discussed in Section 4.3 *Effects on Soils, Watersheds, and Hydrology*. Seedbed preparation and mechanical seeding would result in minor increased infiltration and less runoff within riparian sites. Hand planting of willows and other riparian shrubs on Stony Creek and Upper Smoke Creek would protect water quality by providing streambank stability. These treatments would also provide long-term canopy cover and shade streams from direct solar radiation. Drill seeding native species adjacent to Deep Creek, Rush Creek, West Fork Buffalo Creek, Upper Smoke Creek and Byers Spring would result in more diverse and healthy riparian and upland vegetation that would stabilize the meadows and adjacent uplands.

Riparian/Wetland Stabilization Treatments would result in long-term benefits from land and channel treatments designed to stabilize soil, minimize streambank erosion, and protect adjacent meadow sites. A series of low rock grade stabilization structures will stabilize active erosion along 1,800 feet of Stony Creek, prevent further degradation to the riparian area and meadow, and expand the moisture storing areas of the landscape. These treatments are

expected to be successful in stabilizing the channel and aggrading the channel elevation, raising the water table in the area, and improving riparian vegetation. Furthermore, the project will restore dispersed flow, increase infiltration at every opportunity, and cultivate restorative plant communities to build soil. This will increase the feed value for wildlife and promote biodiversity.

The exclusion of 42 springs and wetlands from grazing will result in healthier, more diverse, and more productive plant communities adjacent to the sites. By protecting these sites from potential degradation the BLM is preventing riparian degradation and loss of sage-grouse habitat. By protecting riparian sites, these treatments will decrease the risk of degradation within riparian areas, allowing for the protection of natural resources for wildlife and wild horses and burros.

In addition, the Proposed Action would remove excess sediment and debris from 100 water catchments that resulted from increased watershed flow from the burned areas of the Rush Fire. These treatments would result in higher amounts of water quantity at each site, and would result in improved water quality for wildlife, wild horses and burros, and livestock.

Removal of livestock from the burned areas as soon as possible would allow protective buffers along drainages to remain in place. These buffers include corridors of willow and herbaceous vegetation which serve to protect streambanks from erosion and filter ash and sediment from adjacent burned areas. Sediment and ash have the potential to clog fish gills, raise water temperatures and pH levels, kill invertebrates, reduce fish spawning habitat and degrade overall water quality for aquatic wildlife species. Some riparian sites have experienced high vegetation burn severity and vegetation mortality, so these plant communities need rest from grazing to recover adequately.

Closure of burned areas to livestock grazing and reducing grazing by wild horses and burros would allow for growth and establishment of riparian vegetation along drainages with persistent water. Establishment of healthy riparian zones would maintain water quality for the benefit of aquatic wildlife species including special status species. Rest from grazing would also allow increase likelihood of successful revegetation of uplands either naturally or from seeding, reducing sediment input to streams from uplands.

Control of invasive plants would maintain healthy watersheds by reducing competition and promoting the establishment of native species adapted to local soil and erosion conditions. Long-term indirect effects from invasive non-native plant treatments would also include improved hydrologic function of the watershed as the site becomes re-vegetated with desirable species.

4.4.2 Effects of Alternative B (No Action) on Riparian/Wetland Sites and Water Quality

With no treatment on riparian areas the risk of soil loss, riparian vegetation mortality, and degradation of sage-grouse habitat may be significant. The runoff potential in areas that were composed of dense shrubs pre-fire, and that rated as Moderate on the burn severity map will be higher in the first year following the fire than pre-fire due to the loss of leaf canopy. After

the first year, recovery of vegetative canopy is generally sufficient to reduce the runoff potential significantly, thus reducing the runoff potential back to near pre-fire levels over the next several years.

The effect of wildfires on storm runoff is well documented. Wildfires typically cause an increase in watershed responsiveness to precipitation events. Burned watersheds can quickly yield runoff due to the removal of protective tree and shrub canopies and litter and duff layers, thus producing flash floods. Burned areas often respond to the local storm events in a much flashier way. The amount of water yield increase is variable and it is often orders of magnitude larger than pre-fire events. These adverse impacts are predominantly true in watersheds that experienced significant consumption of the shrub community and moderate to high soil burn severity effects. Fires may increase the number of runoff events as well since it generally takes a smaller storm to trigger runoff until vegetation begins to recover. Peak flow increases from the fire may also be augmented by debris flows of floatable and transportable material within the active channel areas and steep, incised drainages.

Under Alternative B livestock grazing and wild horse and burro numbers would be large enough to be causing increased pressure to and decreased functionality of riparian areas throughout the burned area. Implementation of the No Action Alternative would result in continuing degradation to approximately 30 riparian/wetland sites in the burned area that have been impacted by high utilization by wild horses. Riparian/wetland sites that are currently rated as Proper Functioning Condition could also be downgraded to Functional At Risk as grazing impacts increase. Impacts include decreased size, vigor and production of individual riparian plant species, increased soil erosion, and a reduction in plant cover and litter. The drinking water for animals would be of low quality due to the amount of sediment in the water.

4.4.3 Cumulative Effects to Riparian/Wetland Sites and Water Quality

The Proposed Action would result in beneficial cumulative effects to riparian/wetland sites. There are very few meadow complexes in the surrounding area (over 0.5 million areas) adjacent to Stony Creek, and most of the meadows are in total private ownership and some are degraded from overgrazing. The Stony Creek meadow treatment will preserve the rare meadow functions on public lands that are at a high risk to loss. Revegetation and erosion control treatments, such as riparian shrub plantings would provide long-term canopy cover and shade the streams from direct solar radiation. These treatments would also maintain and protect water quality by providing streambank stability. Riparian and aquatic environments would see long-term benefits from land and channel treatments designed to stabilize soil, minimize rill and gully erosion, and protect streambanks.

Riparian assessment data from 2008-2010 shows that riparian/wetland sites, especially lentic sources, are being adversely impacted as a result of year-long wild horse use. By reducing wild horse and burro grazing, and temporarily closing livestock allotments it is expected that sites rated as Functioning at Risk will have the opportunity to recover from fire effects, and improve in condition, and no cumulative impacts are expected. Sites currently rated as Proper Functioning Condition would be able to maintain in that condition.

Implementation of the No Action Alternative would result in adverse cumulative effects to at least 30 riparian/wetland sites that are currently rated as Functioning at Risk. Sites that had riparian shrubs burned may recover somewhat from sprouting, but there would be no attempt to replant these species. The meadow complex at Stony creek would degrade further. Without a decrease in livestock and wild horse grazing, it is likely that the functional ratings of riparian areas will decrease, in some cases rapidly. Riparian areas that are recovering from past overgrazing could become de-watered (reversing improvements that have been made over time), as the vegetation converts from riparian dominated vegetation to upland species. If these changes occur, water sources will stay wetter for a shorter period of time, and stand the chance of converting from surface flow (which serves as a water source for horses, burros, livestock and wildlife) to sub-surface flow that is unavailable for drinking water. This would result in increased impacts on remaining spring sources, as animals would concentrate in ever higher numbers on the remaining available drinking water sites.

4.5 Effects on Upland Vegetation, Special Status Plants, and Invasive Species

4.5.1 Effects of Alternative A (Proposed Action) on Upland Vegetation, Special Status Plants, and Invasive Species

Effects on Upland Vegetation

The Proposed Action would implement seeding on up to 31,000 acres which would have beneficial effects to watershed and soil stabilization and overall ecological conditions. Livestock grazing on nine allotments would be temporarily closed to allow seedings and natural revegetation to occur without disturbance. It generally takes two years or longer to successfully establish a new seeding, especially when establishing native plants in an arid environment. During years of below normal precipitation or drought, longer rest periods from livestock grazing may be needed to meet the goals and objectives. It is extremely important to allow re-sprouting vegetation to recover and newly seeded species to become firmly established. Livestock exclusion fencing would protect some of the treated sites from impacts from livestock and wild horses.

Within burned areas of the allotments, vegetation burn severity is high, with 80-95 percent of all grasses, forbs, and shrubs being completely or partially consumed by the fire. The result of two growing seasons of livestock rest and a reduction in wild horse grazing throughout the burned area would:

- Allow natural recovery of plants that will recover on their own to occur (from regrowth or sprouting), without the added pressure and stress of defoliation from livestock grazing.
- Allow the germination and initial growth of seeded plants to occur without ground disturbance from livestock hoof action and trailing.
- Allow seeded plants to establish for at least two years so they are adequately rooted in the soil, to avoid them from being physically pulled out of the soil from livestock grazing.
- Allow seeded plants to grow into mature plants with sufficient leaf growth for photosynthesis and the ability to produce seed before they are grazed.

- Allow riparian areas and wetlands, which are highly preferred grazing areas, to rest from livestock grazing pressure to allow for full recovery of riparian plant growth and vigor to ensure the proper functioning of riparian/wetland sites.
- Allow native plants to recover from wildfire through regrowth and sprouting to provide food, cover, and shelter to wildlife, especially in mule deer, pronghorn, and greater sage-grouse habitats.

Alternative A would temporarily close livestock grazing in burned areas, and would reduce the level of grazing by wild horses and burros. This would reduce the risk of post-fire plant communities becoming overgrazed as they begin to regrow and green-up in the spring, thereby reducing the risk of plants being trampled and/or pulled out from the ground. The combination of seeding, livestock closures, and a reduction in wild horse and burro grazing is expected to be highly effective, as the results will be the recovery and long-term sustainability of productive, healthy, and resilient upland plant communities.

The BLM would repair and rebuild 11 miles of existing permanent drift and pasture division fences that were burned by the Rush Fire. Reconstructed fences would be used to protect seeded areas or areas being managed for natural recovery, and to allow exclusion from livestock and wild horse grazing. Fences would be re-established on original fence line locations. Pasture division fences would allow for proper livestock distribution and grazing system implementation once livestock grazing is re-initiated after closures.

The Proposed Action would implement a temporary travel restriction on 76 designated routes within WSAs in order to prevent erosion and sedimentation within upland sites that have burned, and to protect WSA values. These travel restrictions would protect approximately 120,000 acres of upland vegetation.

There would be some short term direct effects upon upland vegetation within the wild horse gather sites and temporary holding facilities. Each of the gather sites is expected to be used for only a short duration (1-10 days) and at a level of use where effects would be short term. Holding sites would be used for 1 to 30 days. In all trap and holding sites vegetation is expected to be trampled by the animals, with some plants likely becoming uprooted. Annual vegetation will have already set seed for the season, so the effects would be greater to the perennial species, such as bunchgrasses and shrubs. This short term effect is outweighed, however, by reducing the long term impacts to vegetation from grazing by livestock and wild horses and burros on the upland vegetation.

Effects on Noxious Weeds and Invasive Plants

The objectives of invasive non-native plant treatments under Alternative A are to prevent non-native plants from colonizing and establishing in areas disturbed by fire or fire suppression activities. Early detection and control of non-native plant infestations within or adjacent to the burned area are critical in preventing the establishment of these undesirable species and preserving native plant biodiversity.

The Proposed Action would be successful in stopping the spread of undesirable plant species from the initial area of disturbances after fire as a result of chemical and manual treatments and detection. These actions would reduce the likelihood of invasive non-native plant species becoming established and out-competing native plants for available resources as a result of revegetation after seeding and planting, ground cover, and cultural site stabilization. The planned *Erosion Control and Vegetation Restoration Treatments* include seeding and planting, ground cover, and cultural site stabilization, which are designed to increase revegetation of burned areas with native plant species. This will reduce the likelihood of invasive non-native plant species becoming established and out-competing native plants for available resources. Invasive non-native plant treatments are exclusively designed to control nine invasive plants described in Section 3.6. These treatments would maintain ecosystem integrity in the long term, and promote native plant communities adapted to the natural fire regime.

Grazing by livestock and/or wild horses or burros can contribute to the establishment and expansion of noxious weeds and invasive species through various mechanisms. Overgrazing can cause a decline in desirable native plant species and ground cover, which provides a niche for noxious weed invasion. In addition, weed seeds can be transported and introduced to new areas by fecal deposition or by seeds that cling to an animal's coat. Conversely, more moderate levels of grazing, which do not create areas of bare ground, and which maintains the vigor and health of native plant species, particularly herbaceous species, is not expected to cause a substantial increase in noxious weeds or invasive species. Since Alternative A would temporarily close livestock grazing in burned areas, and would reduce the level of grazing by wild horses and burros, this would reduce the risk of post-fire plant communities becoming overgrazed, thereby reducing the risk of spread of noxious weeds and invasive species.

Effects on Special Status Plants

Alternative A would have no adverse effects to the three species of Special Status Plants found within the fire perimeter. The Proposed Action would result in beneficial effects to one species, silverleaf milkvetch, by reducing grazing by livestock and wild horses and burros. Impacts from livestock and wild horse use, including both grazing and trampling, have been recognized as a threat or potential threat to silverleaf milkvetch, particularly at the known site near Rush Creek. Grazing can adversely affect special status plants through removal of plant material and prevention of flowering and fruiting. Trampling can damage or destroy individual plants, and can also affect the habitats of special status plants through compaction of the soil or damage to streambanks.

4.5.2 Effects of Alternative B (No Action) on Upland Vegetation, Special Status Plants, and Invasive Species

Effects on Upland Vegetation

The No Action Alternative would result in adverse effects to some upland vegetation resources that were severely burned. Short term recovery would not occur without seeding in the Moderate to High burn severity areas of the sagebrush dominated communities. In sites that are in early or mid–seral condition, with only a few perennial grasses, the chances are high that the burned area could become dominated by cheatgrass. In light of increased fire

activity and the competitive nature of cheatgrass, the shrub component would likely be slow to reestablish, if it were to recover at all. Once a site becomes dominated by cheatgrass, it would be difficult and expensive to alter the vegetation to a perennial grass dominated community. Some un-burned and burned vegetative communities could recover naturally without any proposed treatments. However, because of the large size of the Rush Fire there would be high grazing use on the un-burned islands from livestock and wild horses, since there would be no reduction in grazing.

Most ecological sites within the fire perimeter were meeting the standards for Upland Soils, but were not meeting the Biodiversity Standard. Adverse impacts to upland vegetation would be seen first on severely burned sites, and on sites that are already close to crossing an ecological successional threshold, or on sites that are closer to water sources. The increased grazing pressure from livestock and wild horses and burros on unburned islands, and on native communities re-sprouting the first year after fire, would result in a decrease in native perennial species, and an increase in non-native annual species or shrubs tolerant of disturbance, such as cheatgrass and rabbitbrush. These changes would decrease the stability, biodiversity, vigor, and production of upland native plant communities in the long term.

Effects on Noxious Weeds and Invasive Plants

The No Action Alternative would not implement early detection and control of nine invasive plants within or adjacent to the burned area. Without detection and treatment these species would become established and could spread at a rate of 200% per year. There is a very high concern for expansion of existing infestations of Scotch thistle and yellow starthistle, as history has shown these two species have an incredibly high rate of spread after fire activity. There is also a very high concern for the spread of perennial pepperweed due to the use of water tenders that were drafting water from an infested water source. Ground disturbing activities during fire suppression (e.g. dozer lines) also present a great potential for new infestations. Hitchhiking propagules could have been picked up from existing infestations or brought in from the fire equipment's original location and spread along fire routes. Native plant communities would be at risk of losing their biodiversity and productivity over time without detection and treatment of these weed species.

Without reduction in livestock and wild horse grazing, there would be increased grazing pressure on unburned islands, and on native communities re-sprouting the first year after fire. This would result in adverse effects such as a decrease in native perennial species, and an increase in non-native annual species or shrubs tolerant of disturbance, such as cheatgrass and rabbitbrush. These changes would decrease the stability, biodiversity, vigor, and production of upland native plant communities in the long term.

Effects on Special Status Plants

Without reductions in livestock and wild horse grazing impacts to special status plants from grazing and trampling could occur. The populations of silver milkvetch at the Rush Creek site would be at high risk of being reduced in size and numbers of individual plants.

4.5.3 Cumulative Effects to Upland Vegetation, Special Status Plants, and Invasive Species

Alternative A would result in beneficial cumulative effects to Upland Vegetation and Special Status Plants. Under the Proposed Action, livestock grazing would be temporarily closed and the numbers of wild horses and burros would be reduced within the fire perimeter, which would result in decreased impacts to upland vegetation. While the majority of the allotments are meeting the Biodiversity Standard, the Winter Range CA and Deep Cut Allotments are rated as not meeting the standard. The basis for this determination included alterations of the vegetation classes caused by seedings and wildfire, with a resulting type conversion to non-native annual grasses. While these temporary reductions in grazing may not be able to restore plant communities that have crossed an ecological threshold to annual species, it would help prevent areas dominated by invasive species from spreading post-fire. It would lessen the impacts to perennial grasses, thus allowing them to better recover from the fire, and to better compete with non-native annual grasses such as cheatgrass and medusahead.

The No Action Alternative would result in adverse cumulative effects to some upland vegetation resources that were severely burned. Plant communities that been impacted in the past by wildfires and historic livestock grazing would be very vulnerable to losing native perennial grasses, due to the high amount of surface disturbance and trampling. As the percentage of perennial plant cover decreases within the burned areas, the amount of annual plant cover from invasive species would increase, as these species are adapted to filling in gaps (areas devoid of vegetation) when such gaps occur. This change in functional/structural groups will have an adverse effect on upland vegetation and forage resources. Soils would become less resistant to trampling impacts and would become more susceptible to wind or water erosion. Many sites that have undergone previous disturbance would transition from plant communities dominated by native perennials to ones dominated by invasive annuals such as cheatgrass. The biodiversity and production of these sites would decrease, and the chance for large-scale catastrophic wildfire within the previously burned area would increase.

4.6 Effects on Native Wildlife and Sage-grouse Habitat

4.6.1 Effects of Alternative A (Proposed Action) on Native Wildlife and Sage-grouse Habitat

Effects on Native Wildlife

Alternative A would result in beneficial direct and indirect effects to native wildlife. During *Erosion Control and Vegetation Restoration Treatments* such as seeding and planting and for the first year following treatments, there would be a short-term period when associated wildlife habitat values would be low. Low vegetation density and temporary ground disturbance associated with these treatments could affect wildlife's need for food, nesting, or cover. However, given that the affected environment is a burned area, these pre-existing habitat values will already be low, and conditions will improve substantially a few years following the implementation of these treatments. Once the burned areas are revegetated, new seasonal growth would provide palatable forage and a better diversity of native perennial grass, forbs, and shrub species. Over time, mosaics of mature shrubs and trees would provide

suitable habitat for those species of wildlife dependent on late seral stage plant communities. During installation, ground and aerial seedings would likely displace mobile wildlife, but long-term benefits of these treatments would offset these temporary impacts. *Riparian/Wetland Stabilization Treatments* such as streambank armoring and willow plantings would benefit those species dependent on the recovery of vegetation in riparian areas. The recovery of native, riparian vegetation would reduce the risk of post-wildfire flooding and land sliding that could impact availability of prey species and cover. Revegetation with native species in addition to invasive non-native plant treatments would benefit most wildlife species in the long-term by maintaining ecosystem integrity and promoting continuation of the natural fire regime.

Riparian and wetland sites within the Rush Fire perimeter provide essential habitat and drinking water for many species of native wildlife. The Proposed Action is designed to improve and protect streams (and associated riparian and wetland communities) by temporary closing to livestock grazing for two years, and reducing the number of wild horses and burros. It is estimated that approximately 30 riparian/wetland sites that are currently being impacted by wild horses, would improve in condition within two to three years. Enhanced conditions of these sites would include increased vigor and production of plants which provide forage and cover for wildlife throughout the year.

The implementation of *Wildlife Habitat Improvements* would result in improved quality of drinking water for wildlife at several spring sites that would be fenced, as a result of the reduction of sediment in the water, and an increase in hiding cover. In addition, the Proposed Action would remove excess sediment and debris from 100 water catchments that resulted from increased watershed flow from the burned areas of the Rush Fire. These watering sites are used extensively by wildlife. Guzzlers that have been used by wildlife for a period of several years have now been damaged by the Rush Fire. The Proposed action would repair these sites to ensure a continued clean water source, which would benefit several species of wildlife.

In order to restore important wildlife habitat, particularly for mule deer and pronghorn, the BLM would hand plant approximately 178 acres with seedling plugs of bitterbrush, mountain mahogany, coyote willow, and red willow. These seedings are designed to provide cover and forage for at least 250 wildlife species that inhabit sagebrush habitats and interspersed riparian/meadow habitat including sage-grouse, and migratory birds. It would also provide vegetation needed for ecological site dynamics. These actions will improve the biodiversity of plant communities over time, and will provide an immediate increase in herbaceous plant production that would become available for wildlife forage and cover.

The amount of biodiversity in a vegetation community is very important in providing wildlife forage, browse, and cover. Upland communities that contain a mixture of perennial grasses, forbs, and shrubs supply the best quality environment for many wildlife species, including mule deer and pronghorn. While the majority of the allotments are meeting the Biodiversity Standard, many individual areas are not meeting the standard due to the alteration of vegetation classes, primarily from overgrazing and previous wildfires. Some areas have experienced a type conversion to non-native annual grasses, while other areas have lost their

shrub component due to wildfires. These areas provide an overall reduced quality of habitat for many wildlife species.

By implementing seedings, plantings, and erosion control treatments, and reducing grazing by livestock, and wild horses and burros, noxious weeds and invasive species will be prevented from spreading and infesting new areas. The removal of grazing pressure would lessen the impacts to perennial grasses, thus allowing them to better recover from the wildfire, and to more effectively compete with non-native annual grasses such as cheatgrass and medusahead.

Effects on Sage-grouse Habitat

Alternative A would result in beneficial direct and indirect effects to sage-grouse habitat through seedings and plantings, protection of riparian/wetland sites, and the repair of grazing exclosures and fences. The Rush Fire was virtually entirely within the Buffalo-Skedaddle Population Management Unit (PMU) of Greater Sage-grouse, burning 19% of the total area of the PMU. Pre-fire habitat degradation included previous wildfires, western juniper expansion, and the invasion of exotic grasses (COT 2012). Recent population trends have shown consistent increases during years of favorable environmental conditions, however habitat suitability is generally considered low throughout the PMU.

The fire burned quickly throughout most of the area, leaving many islands of unburned vegetation (up to 1,800 acres in size) and generally low soil burn intensity. Sage-grouse are characterized as a landscape-scale species, inhabiting large, interconnected expanses of sagebrush (Connelly et al. 2011). While the unburned islands within the fire area should provide a seed source for the reestablishment of vegetation, it is unlikely that they are large enough to allow persistence of nesting at pre-burn levels.

In general, areas of low soil burn severity would be expected to recover naturally, as seed banks and grass crowns remain intact. Mountain big sagebrush (*Artemesia tridentata* ssp. *vaseyana*) often recovers after a fire from seed remaining in the soil, however basin big sagebrush (*Artemesia tridentata* ssp. *tridentata*) and Wyoming big sagebrush (*Artemesia tridentata* ssp. *wyomingensis*) are generally considered to be fire-intolerant and do not resprout after wildfire (Lambert 2005). Wyoming big sagebrush is the slowest of the big sagebrush species to recover due to low seed production in most years and dry conditions preventing establishment of seedlings (Rhodes et al. 2010). Wyoming big sagebrush habitats may take as long as 35 years to more than 50 years to recover. As mentioned above, much of the habitat within the fire perimeter is at risk of conversion to annual grassland. Seeding of native grasses and sagebrush would assist in the prevention of conversion to annuals, and would decrease the recovery time overall.

Water sources are important for grouse during the late-brooding period, providing insects and forbs as herbaceous vegetation desiccates in sagebrush uplands (Connelly et al. 2011). Springs are relatively numerous throughout the burn area, although many exhibit degradation from use by livestock, wild horses, and burros. Some riparian vegetation was already observed resprouting during surveys, including sedges (*Carex* sp.), Great Basin wildrye (*Leymus cinereus*), and wild rose (*Rosa* sp.). Under the Proposed Action, important spring sources are expected to be protected during regeneration due to rest from livestock grazing, a

reduction in wild horse grazing, and the construction or repair of exclosure fencing. In addition, the Proposed Action would remove excess sediment and debris from 100 water catchments that may be used as drinking sources for sage-grouse. Guzzlers potentially used by sage-grouse would be repaired so they would be available as clean water sources for sage-grouse if necessary.

Grazing by livestock or wild horses and burros can have an effect on sage-grouse habitat through direct competition for forage (forbs) and through the reduction of plant cover needed for nesting. Grass height and cover affect sage-grouse nest site selection and success. Indirect evidence suggests grazing significantly reduces the herbaceous understory in breeding habitats and may have adverse impacts on sage-grouse populations. Probably the most significant long-term adverse impact to sage-grouse from excessive grazing is the degradation of sagebrush, meadow, and riparian communities (Miller and Eddleman, 2001) on which they depend. The Proposed Action would temporarily close livestock grazing, and reduce the wild horse and burro populations, resulting in reduced forage utilization. This would result in more diverse and vigorous upland and riparian/wetland plant communities, and in the stabilization of the soils and streambanks in these areas. Forage and cover are also predicted to increase, resulting in improved habitat for sage-grouse and other wildlife.

4.6.2 Effects of Alternative B (No Action) on Native Wildlife and Sage-grouse Habitat

Effects on Native Wildlife and Sage-grouse Habitat

Alternative B would result in adverse impacts to sage-grouse and other wildlife because no seedings or plantings would be undertaken. While the unburned islands within the fire area should provide a seed source for the reestablishment of vegetation, it is unlikely that they are large enough to allow persistence of nesting at pre-burn levels. Wyoming big sagebrush habitats may take as long as 35 years to more than 50 years to recover. Areas that were preferred habitat for mule deer and pronghorn would not be reseeded to bitterbrush and other shrubs, thereby reducing important browsing vegetation. Without treatments for the control of noxious weeds and invasive plants, much of the sage-grouse habitat within the fire perimeter would be at risk of conversion to weeds or annual grasslands.

Alternative B would result in continued grazing by livestock and wild horses, compounding impacts upon upland and riparian vegetation. Since most upland sites were consumed by the wildfire, impacts would likely become widespread throughout the area until grazing animals could no longer sustain themselves on the range. Impacts would be seen first in sites that are already close to crossing an ecological successional threshold, or on sites relatively close to water sources. The increased grazing pressure from livestock and wild horses would result in a decrease in native perennial species, and an increase in non-native (and invasive) annual species such as cheatgrass or shrubs tolerant of disturbance, such as rabbitbrush. This would reduce the diversity, quality and production of species that provide forage and cover for sage-grouse and other wildlife.

Implementation of Alternative B would result in degradation of approximately 30 riparian/wetland sites that are currently being documented as impacted by high utilization from wild horses. Riparian and wetland sites that are currently in PFC would also be at risk

of degradation as livestock and wild horse grazing continues. This degradation would cause a rapid decline in the amount and quality of riparian habitat for several wildlife species.

Drinking water for wildlife would be of low quality due to the high amount of sediment in the water resulting from the wildfire and increased animal use. Many of these sites would be devoid of hiding cover. With no repairs of the existing guzzlers, water would not be collected and provided for wildlife use. This would result in a reduction of clean water sources for sage-grouse and many other species of wildlife that have utilized them over the years as dependable water sources. The loss of these water sources after long-term existence could be significant, especially during drought years, and dry, hot summers.

4.6.3 Cumulative Effects on Native Wildlife and Sage-grouse Habitat

The Proposed Action is not expected to degrade wildlife habitat from its current condition. Other impacts to sage-grouse and other wildlife habitat that have occurred within the area include historic livestock grazing and previous wildfires. Livestock grazing within the burned area would be temporarily closed to allow native plants the ability to recover from being burned. After monitoring objectives have been met, the allotments would continue to be managed in compliance with land health standards and livestock grazing standards and guidelines.

Maintaining a balance of grazing animals, and controlling the timing and amount of forage that is consumed each year by livestock and wild horses is crucial to allowing healthy upland plant communities that provide important wildlife forage and cover to recover from the effects of wildfire. By reducing grazing of livestock and wild horses and burros as described in the Proposed Action, cumulative impacts to wildlife habitat are not expected to occur. Habitat enhancement projects, including the fencing of riparian and spring sites from livestock and wild horses, and repairing fences around spring sites and guzzlers should, over time, further improve the habitat quality for sage-grouse and other wildlife.

Implementation of the Alternative B would result in degradation to approximately 30 riparian/wetland sites within the fire perimeter that are currently being impacted by high utilization by wild horses and burros. These impacts would cause a rapid decline in the amount and quality of riparian habitat for several wildlife species. Riparian and wetland sites that are at PFC would also be at risk of degradation. Over time drinking water for sage-grouse and other wildlife would become nonexistent in some areas, or be of very low quality due to the high amount of sediment in the water from the wildfire, and from increased grazing and trampling. Sage-grouse habitat would become degraded, especially in riparian and wetland communities. Nesting success would be impacted as sites remain devoid of native perennial species, and have reduced amounts of plant cover and litter.

4.7 Effects on Wilderness Study Areas

4.7.1 Effects of Alternative A (Proposed Action) on Wilderness Study Areas

Due to the extent of the Rush Fire, widespread resource disturbance occurred within six

WSAs, which has led to diminished environmental stability, ecologic function, and wilderness character. The burned areas suffered significant environmental loss, including substantial reductions in priority year-round sage-grouse habitat which is also crucial to the sustainability of mule deer and pronghorn populations. Ongoing impacts without treatment may include the loss of vegetative composition and the expansion of invasive weeds.

Implementation of *Erosion Control and Vegetation Restoration Treatments* would speed up the revegetation process through seeding and rest from livestock grazing for a minimum of two growing seasons. The Proposed Action would implement seeding on up to 31,000 acres which would have beneficial effects to watershed and soil stabilization and overall ecological condition. Soil and watershed stabilization following wildland fire would be enhanced by successful reestablishment of native plants, where treatments are implemented and where natural revegetation is adequate to protect soil surfaces. Successful revegetation would facilitate soil stabilization of exposed burned soils. Revegetation efforts would provide indirect beneficial effects on soils by providing cover and root structure from seedings which would minimize soil loss through wind and water erosion. Wildlife habitat would benefit from improved cover and production of native plant communities. Under the Proposed Action, livestock grazing would be temporarily closed and the numbers of wild horses and burros would be reduced within the fire perimeter, which would result in decreased impacts to native vegetation.

The loss of vegetative cover has created increased resource risk within WSAs due to the openness of the physical landscape. The Proposed action would implement a temporary travel restriction on 76 designated routes within WSAs in order to prevent erosion and sedimentation within the burned area, and to protect WSA values on approximately 120,000 acres.

The Proposed Action would result in direct, short-term impacts to wilderness values within the six WSAs resulting from the wild horses and burro gather. During the proposed gather, solitude and primitive recreation may be adversely impacted for recreationists who would be subjected to the sight and sound of the helicopter used for the gather operations. This impact would only be temporary and of relatively short duration, as each capture site would be utilized for only 1 to 10 days, and only during daylight hours.

All approved trap sites are on, or next to, roads that provide access for trucks pulling stock trailers. During a gather, portable panels would be set up at each capture site for about 10 days. The capture sites are not expected to be used again for at least three years. The amount of surface disturbance, which would be limited to trampled vegetation and soils, would be up to one acre at each site. The gather operations would result in minor adverse impacts to wilderness characteristics in the form of trampled and crushed vegetation by vehicles and by animals as they approach the trap site. However, reducing the number of wild horses and burros would result in long term benefits to wilderness characteristics, as this would reduce the damage to native plant communities and water sources damaged by the wildfire.

4.7.2 Effects of Alternative B (No Action) on Wilderness Study Areas

The No Action Alternative would result in adverse impacts to WSAs through the loss of

native vegetation and the expansion of invasive weeds. Without treatments it is unlikely that the Wilderness Study Areas affected by the Rush Fire will stabilize and restore naturally to their pre-fire condition. Due to the severity of the disturbance, native seed sources are no longer available across much of the fire area, in combination with the threat of succession from invasive species, these limitations make environmental stability and the progression to a functioning ecological state unlikely.

The burned areas suffered significant environmental loss, including substantial reductions in the amount of native perennial grasses and sagebrush. Under the No Action Alternative this loss of cover and forage will have a profound adverse effect on priority year-round sage-grouse habitat, and the sustainability of mule deer and pronghorn populations.

Alternative B would result in continued grazing by livestock and wild horses, compounding adverse impacts to upland and riparian vegetation, soils, and water sources and therefore reducing wilderness character. These impacts would affect the following wilderness values: 1) soil stability, 2) condition or trend of the vegetation, 3) natural biological diversity, 4) naturalness, and 5) quality of surface water. The amount of damage to plant communities from overgrazing and trampling that would result from this alternative would have the potential to reduce the overall wilderness qualities within six WSAs.

The loss of vegetative cover has created increased resource risk to WSA character due to the openness of the physical landscape. Prior to the Rush fire, a dense brush component and large rocks hidden by vegetation were an effective means of keeping ATVs and other vehicles used by the public on designated routes. Areas normally inaccessible to motor vehicles due to thick vegetation are now easily traversable due to heavy wildland fire damage. Under Alternative B uncontrolled cross-country motor vehicle travel is expected to increase due to the reduction in visual and physical barriers. There would be an increased risk of damage to soils and vegetation and an overall adverse effect to wilderness character due to unauthorized vehicle travel.

4.7.3 Cumulative Effects to Wilderness Study Areas

Alternative A would result in beneficial cumulative effects to Wilderness Study Areas. The implementation of *Erosion Control and Vegetation Restoration Treatments* would provide long term beneficial cumulative effects to the following wilderness values: 1) soil stability, 2) condition or trend of the vegetation, 3) natural biological diversity, 4) naturalness, and 5) quality of surface water. Plant communities within the Rush Fire perimeter contain several sites where vegetation has been impacted by previous wildfires, historic livestock grazing, and other disturbances, which have altered the native plant composition. Maintaining a balance of grazing animals, and controlling the timing and amount of forage that is consumed each year by livestock and wild horses is crucial to preventing further damage to native plant communities, which comprise important wilderness characteristics, such as soil stability, condition of native vegetation, natural biological diversity, naturalness, and quality of surface water. By temporarily closing livestock grazing and reducing wild horses and burros, native plant communities are expected to continue to meet land health standards through natural regeneration, and would maintain their ecological condition and biodiversity.

Alternative B would result in adverse cumulative impacts to WSAs. The continuation of livestock and wild horse grazing would result in a high amount of disturbance to native vegetation and soils which would directly impact wilderness characteristics. Plant communities which have been impacted in the past by wildfires and historic livestock grazing would be very vulnerable to new invasions of invasive species, and to loss of biodiversity, due to the high amount of surface disturbance and trampling. Without invasive plant treatments, cumulative impacts would be a higher rate of spread of invasive weeds into new areas, and overall lowered condition of native plant communities. These damages to wilderness character may require future rehabilitation treatments and increased costs to manage the WSA. Additionally, diminished wilderness character may impair WSA eligibility for future wilderness designation by Congress as discussed in the 6330 Wilderness Study Area Manual.

4.8 Effects on Wild Horses and Burros and their Habitat

This analysis of impacts to wild horses and burros is tiered to the Environmental Assessment (EA) for the *Twin Peaks Herd Management Area Wild Horse and Burro Gather Plan* (DOI-BLM-CA-N050-2010-05-EA), July 2010 and the Environmental Assessment (EA) for the *Buckhorn and Coppersmith Herd Management Areas Wild Horse Population Management Plan,* (DOI-BLM-CA-N050-2012-50-EA), August 2012.

4.8.1 Effects of Alternative A (Proposed Action) on Wild Horses and Burros

Wild Horse and Burro Health

Alternative A includes the gather and removal of 728 wild horses and 203 burros from the Twin Peaks and Buckhorn HMAs within the Rush Fire perimeter and within a five mile buffer, in order to remove the horses from rangeland that has been severely burned over and does not supply adequate forage resources. Overall vegetation burn severity inside the fire perimeter is 85-95%, with most individual forage plants completed consumed. Due to the extreme loss of forage, wild horses and burros are undergoing a detrimental loss of body condition, and are stressed due to the need to travel long distances to obtain forage and water. The lack of basic food and water resources is considered critical to the survival of these horses and burros, especially going into the winter months.

The BLM plans to leave 320 wild horses and 72 burros within the Twin Peaks HMA to guarantee that sustainable populations are able to thrive within the unburned areas. This number of burros is within the original established AML range of 72-1160. The BLM will leave 59 horses in the Buckhorn HMA, which is at the low appropriate management level for that HMA. Based on past foaling rates for the Twin Peaks HMA of 17 to 20% per year (Reference *Twin Peaks HMA EA, 2010,* Section 3.1.6, pages 35-37), it would only take two to three years for the wild horse population to return to within the original established AML range of 448 to 758 horses. After this two to three year period it is expected that the rangelands will have at least partially recovered from the effects of the Rush Fire, and that adequate forage resources would be available, unless there are continued drought conditions.

Removal of some of the wild horses and burros within the HMAs would result in improved horse health and body condition. The animals would be placed in temporary holding facilities

and fed hay and water. The horses and burros would gain weight and improve body condition immediately. Mares in foal would receive adequate nutrition in order to prevent them from losing an extreme amount of body condition and from losing their foals. Horses and burros needing medical attention would receive treatments by a licensed veterinarian to cure their ailments and to prevent additional distress.

Implementation of Alternative A would result in a lower density of wild horses and burros remaining within the Rush Fire perimeter. Wild horses and burros that remain in the HMAs would undergo reduced competition for scarce forage resources, thus allowing them to utilize the remainder of the small amount of unburned habitat. Confrontations between stallions, johns, or jacks and fighting amongst bands at water sources would also become less frequent. The emergency gather would improve the overall health and fitness of all wild horses and burros in the HMAs and would also maintain foaling rates and foal survival rates. Implementation of *Erosion Control and Vegetation Restoration Treatments* would speed up the revegetation process on most of the burned sites, and prevent the spread of noxious weeds and invasive plants. Alternative A would benefit wild horse and burro health in the long term through reseeding on up to 32,000 acres, and the allowance of plants to revegetate naturally without disturbance from livestock grazing for two growing seasons. Once the seeded and natural regeneration areas are sufficiently recovered, the forage base would be consist of improved and palatable/nutritious plant species. The successful recovery of burned plants will ensure that the HMAs will contain sufficient forage for sustainable wild horse and burro grazing into the future. The overall results will be productive, healthy, resilient, and sustainable plant communities.

Riparian/Wetland Stabilization Treatments would result in long-term benefits to wild horses and burros by stabilizing spring and meadow sites that the horses and burros use as key foraging areas. These treatments are expected to be successful in stabilizing the channel and aggrading the channel elevation, raising the water table in the area, and increasing productivity of riparian plant communities.

In addition, the Proposed Action would remove excess sediment and debris from 100 water catchments that resulted from increased watershed flow from the burned areas of the Rush Fire. The functioning of these water sources is critical to the wild horses and burros that use the sites for their drinking water. These treatments would result in higher amounts of water quantity at each site, and would result in improved drinking water quality for wild horses and burros.

Effects of Gather Operations

Impacts to wild horses and burros under Alternative A would be both direct and indirect, occurring to both individuals and the populations as a whole. The BLM has been actively conducting wild horse gathers since 1976 within the Eagle Lake Field Office. Through this time, gather methods and procedures have been identified and refined throughout the western Unites States, in order to minimize stress and impacts to wild horses during implementation of gather operations. The BLM and Contractor would implement several standard operating procedures (SOPs) to ensure that a safe and humane gather occurs, and to minimize potential stress and injury to wild horses. The SOPs are outlined in Appendix A.

Since 2004, the BLM has gathered over 26,000 excess animals in California and Nevada. Of these, mortality has averaged only 0.5% to 1.0% which is very low when handling wild animals. Another 0.6% of the animals captured were humanely euthanized due to pre-existing conditions and in accordance with BLM policy. This data affirms that the use of helicopters and motorized vehicles has proven to be a safe, humane, effective and practical means for the gather and removal of excess wild horses and burros from the public lands. The BLM also avoids gathering wild horses prior to or during the peak foaling season and therefore does not conduct helicopter removals of wild horses during March 1 through June 30.

Over the past 40 years, various impacts to wild horses and burros from wild horse gather operations have been observed. Individual, direct impacts include handling stress associated with the gather, capture, sorting, animal handling, and transportation of the animals. The intensity of these impacts varies by individual, and is indicated by behaviors ranging from nervous agitation to physical distress. Observations made through completion of gathers shows that captured wild horses acclimate quickly to the holding corral situation, becoming accustomed to water tanks and hay, as well as human presence. Horses and burros are very adaptable animal, and will typically assimilate into the new environment with other animals quite easily.

Injuries sustained by wild horses and burros during gathers include nicks and scrapes to the legs, face, or body from brush or tree limbs while being herded at a measured pace by the helicopter. Rarely, animals will encounter barbed wire fences and will receive wire cuts. These injuries are not fatal and may be treated with medical spray at the holding corrals until a veterinarian can examine the animal. Most injuries are sustained once the animal has been captured, and is either within the trap corrals or holding corrals, or during transport between the facilities, or during sorting. These injuries result from kicks and bites, and from animals making contact with corral panels or gates.

Transport and sorting of gathered horses is completed as quickly and safely as possible to reduce the occurrence of fighting, and to move the animals into large holding pens so they can settle in with hay and water as soon as possible. Injuries received during transport and sorting consist of superficial wounds of the rump, face, or legs. Despite precautions, occasionally a wild horse or burro will rear up, or make contact with panels hard enough to sustain a fatal injury, though such incidents are rare. There is no way to reasonably predict any of these types of injuries. On many gathers, no animals are injured or die. On some gathers, due to the temperament of the animals, they are not as calm, and injuries are more frequent. Overall, however, injuries and death are not frequent and usually average less than 0.5% to 1.0% of the total animals captured.

During the actual herding of horses or burros with a helicopter, injuries are rare, and consist of scrapes and scratches from brush, or occasionally broken legs from animals stepping into a rodent hole. Serious injuries requiring euthanasia could occur in 1-2 animals per every 1,000 captured based on prior gather statistics. Though some members of the public have expressed the view that helicopter gathers are not humane, most documented injuries have occurred once the animals are captured, not during the helicopter gather operations. Similar injuries would also be sustained if the horses or burros were captured through bait and/or water

trapping, as the animals would still need to be sorted, aged, transported and otherwise handled.

Indirect individual impacts are those impacts which occur to individual horses or burros after the initial stress event, and may include spontaneous abortions in mares, and increased social displacement and conflict in stallions, johns, or jacks. These impacts, like direct individual impacts, are known to occur intermittently during gather operations. An example of an indirect individual impact would be the brief skirmish which occurs with older studs following sorting and release into the stud pen which lasts less than two minutes, and ends when one stud retreats. Traumatic injuries usually do not result from these conflicts. These injuries typically involve a bite and/or kicking with bruises, which do not break the skin. Like direct individual impacts, the frequency of occurrence of these impacts among a population varies with the individual. Spontaneous abortion events among mares following capture is relatively rare, especially during late summer or early fall gathers.

A few foals may be orphaned during gathers. This may occur due to:

- The mare rejects the foal. This occurs most often with young mothers or very young foals;
- The foal and mother become separated during sorting, and cannot be matched;
- The mare dies or must be humanely euthanized during the gather;
- The foal is ill, weak, or needs immediate special care that requires removal from the mother; or
- The mother does not produce enough milk to support the foal.

Oftentimes, foals are gathered that were already orphans on the range (prior to the gather) because the mother rejected it or died. These foals are usually in poor, unthrifty condition. Orphans encountered during gathers are cared for promptly and rarely die or have to be euthanized.

The foals that would be gathered during fall and winter would be between eight and ten months of age and would be ready for weaning from their mothers. In private industry, domestic horses are normally weaned between four and six months of age. Adherence to standard operating procedures, as well as the techniques utilized by the gather contractor, would minimize heat stress. Electrolytes are routinely administered to the drinking water during gathers that involve animals in weakened conditions or during summer gathers. Additionally, BLM staff maintains supplies of electrolyte paste to directly administer to an affected animal. Heat stress does not occur often, but if it does, death can result.

Through the capture and sorting process, wild horses or burros are examined for health, injury and other defects. Decisions to humanely euthanize animals in field situations would be made in conformance with BLM policy. BLM Euthanasia Policy IM-2009-041 is used as a guide to determine if animals meet the criteria and should be euthanized (refer to SOPs Appendix A). Animals that are euthanized for non-gather related reasons include those with old injuries (broken hip, leg) that have caused the animal to suffer from pain, or prevents

them from being able to travel or maintain body condition; old animals that have lived a successful life on the range, but now have few teeth remaining, are in poor body condition, or are weak from old age; and animals that have congenital, genetic, or serious physical defects such as club foot, ruptures, or sway back, and would not be successfully adopted, or should not be returned to the range.

The wild horses and burros that are not captured may be temporarily disturbed and move into other areas during the gather operations. With the exception of changes to herd demographics, direct population-wide impacts seem to be temporary in nature, with most if not all impacts disappearing within hours to several days of release. No observable effects associated with these impacts would be expected within one month of release, except for a heightened awareness of human presence.

The primary effects to the populations that would be directly related to this proposed gather would be to herd population dynamics, age structure or sex ratio, and subsequently to the growth rates and population size over time. It is not expected that genetic health would be adversely impacted by Alternatives A.

The primary benefit of an emergency gather within the Rush Fire area would be directly to the survival of the animals therein, and also to the health and sustainability of habitat attributes. Burned over forage and water resources would be allowed to improve in quality and quantity. Improved rangeland and riparian/ wetland conditions and increased forage availability would promote healthy viable, self-sustaining populations of wild horses. A thriving ecological balance between wild horses and other resource uses would be met throughout the HMA, and future deterioration of the resources from an overpopulation of wild horses would be avoided. Managing wild horse and burro populations in balance with their habitat and with other multiple uses would ensure that the populations are less affected by drought or other climate fluctuations, and that additional emergency gathers in the future are either avoided or minimized. This would result in reduced stress to the animals, and increasing the long-term success of these herds.

Impacts to Horses Removed from the Burned Area

Transport, Short Term Holding, and Adoption Preparation

Wild horses removed from the burned area would be transported to the receiving short-term holding facility in a goose-neck stock trailer or straight-deck semi-tractor trailers. Trucks and trailers used to haul the wild horses and burros will be inspected prior to use to ensure wild horses can be safely transported. The animals would be segregated by age and sex when possible, and loaded into separate compartments. Mares and their un-weaned foals may be shipped together.

Transportation of recently captured wild horses or burros is limited to a maximum of 8 hours. During transport, potential impacts to individual horses can include stress, as well as slipping, falling, kicking, biting, or being stepped on by another animal. Unless the animals are in extremely poor condition, it is rare for an animal to die during transport.

Upon arrival, recently captured wild horses and burros are off-loaded by compartment and placed in holding pens where they are fed good quality hay and water. Most wild horses begin to eat and drink immediately and adjust rapidly to their new situation. At the short-term holding facility, a veterinarian provides recommendations to the BLM regarding care, treatment, and if necessary, euthanasia of the recently captured wild horses. Any animals affected by a chronic or incurable disease, injury, lameness or serious physical defect (such as severe tooth loss or wear, club foot, and other severe congenital abnormalities) would be humanely euthanized using methods acceptable to the American Veterinary Medical Association (AVMA). Wild horses in very thin condition or animals with injuries are sorted and placed in hospital pens, fed separately and/or treated for their injuries. Recently captured wild horses, generally mares, in very thin condition may have difficulty transitioning to feed. A small percentage of animals can die during this transition, however, some of these animals are in such poor condition that it is unlikely they would have survived if left on the range.

After recently captured wild horses and burros have transitioned to their new environment, they are prepared for adoption or sale. The preparation involves freeze-marking the animals with a unique identification number, vaccination against common diseases, castration, and de-worming. During the preparation process, potential impacts to wild horses are similar to those that can occur during transport. Injury or mortality during the preparation process is rare, but can occur.

At short-term corral facilities, a minimum of 700 square feet is provided per animal. Mortality at short-term holding facilities averages approximately 5% (GAO-09-77, Page 51), and includes animals euthanized due to a pre-existing condition, animals in extremely poor condition, animals that are injured and would not recover, animals which are unable to transition to feed; and animals which die accidentally during sorting, handling, or preparation.

Adoption

Adoption applicants are required to have at least a 400 square foot corral with panels that are at least six feet tall. Applicants are required to provide adequate shelter, feed, and water. The BLM retains title to the horse for one year and the horse and facilities are inspected. After one year, the applicant may take title to the horse or burro, at which point the animal becomes the property of the applicant. Adoptions are conducted in accordance with 43 CFR 5750.

Sale with Limitation

Buyers must fill out an application and be pre-approved before they may buy a wild horse or burro. A sale-eligible wild horse is any animal that is more than 10 years old; or has been offered unsuccessfully for adoption at least 3 times. The application also specifies that all buyers are not to sell to slaughter buyers, or to anyone who would sell the animals to a commercial processing plant. Sale of wild horses and burros is conducted in accordance with the 1971 WFRHBA and congressional limitations.

Long Term Holding

During the past 3 years, the BLM has removed 19,414 excess wild horses and burros from the Western States. Most animals not immediately adopted or sold have been transported to long-

term holding (LTH) grassland pastures in the Midwest.

Potential impacts to wild horses from transport to adoption, sale or to LTH pastures are similar to those previously described. One difference is that when shipping wild horses or burros for adoption, sale or LTH, animals may be transported for a maximum of 24 hours. Immediately prior to transportation, and after every 24 hours of transportation, animals are offloaded and provided a minimum of 8 hours on-the-ground rest. During the rest period, each animal is provided access to unlimited amounts of clean water and 2 pounds of good quality hay per 100 pounds of body weight, with adequate bunk space to allow all animals to eat at one time. The rest period may be waived in situations where the anticipated travel time exceeds the 24-hour limit, but the stress of offloading and reloading is likely to be greater than the stress involved in the additional period of uninterrupted travel.

Long-term grassland pastures are designed to provide excess wild horses and burros with humane, and in some cases, life-long care in a natural setting off the public rangelands. The wild horses and burros are maintained in grassland pastures large enough to allow free-roaming behavior and with the forage, water, and shelter necessary to sustain them in good condition. About 22,700 wild horses, that are in excess of the current adoption or sale demand (because of age or other factors such as economic recession), are currently located on private land pastures in Oklahoma, Kansas, and South Dakota.

Establishment of LTH pastures was subject to a separate NEPA and decision-making process. Located in mid or tall grass prairie regions of the United States, these LTH pastures are highly productive grasslands compared to more arid western rangelands. These pastures comprise about 256,000 acres (an average of about 10-11 acres per animal). Of the animals currently located in LTH, less than one percent is age 0-4 years, 49 percent are age 5-10 years, and about 51 percent are age 11+ years.

Mares and sterilized stallions (geldings) are segregated into separate pastures (except at one facility where geldings and mares coexist). Although the animals are placed in LTH, they remain available for adoption or sale to qualified individuals. Foals born to pregnant mares in LTH pastures are gathered and weaned as necessary and are made available for adoption. The LTH pasture contracts specify the care that wild horses must receive to ensure they remain healthy and well-cared for. Handling by humans is minimized to the extent possible, although regular on-the-ground observations are made by the LTH contractor and periodic counts are conducted by BLM personnel and/or veterinarians to ascertain the animals' well-being and safety. A very small percentage of the animals may be humanely euthanized if they are in very poor condition due to age or other factors.

Although horses and burros residing on LTH facilities live longer, on the average, than wild horses residing on public rangelands, natural mortality of wild horses in LTH pastures averages approximately 8% per year, but can be higher or lower depending on the average age of the horses pastured there (GAO-09-77, Page 52).

Euthanasia and Sale without Limitation

While euthanasia and sale without limitation has been limited by Congressional

appropriations, it is allowed under the *Wild Free-Roaming Horses and Burros Act of 1971* (as amended). Currently, neither option is available for healthy horses that are gathered under the Department of the Interior's fiscal year 2012 budgetary appropriations.

4.8.2 Effects of Alternative B (No Action) on Wild Horses and Burros

Under Alternative B the BLM would not gather or remove any wild horses or burros from the Rush Fire area. Within a few weeks of going into winter many wild horses and burros would begin running out of forage and water, and would be in low body condition. Over the winter months many horses and burros may starve or succumb to disease related to malnutrition. At some point the population would crash, probably during an unusually cold or snowy period. In addition the wild horses and burros would be causing serious impacts to soil stability, vegetation, water sources (springs and creeks), and wildlife habitat. The burned over vegetation would be repeatedly grazed by the horses looking for feed sources, and would not be allowed to recover from their burned condition.

Under Alternative B the increasing population of wild horses would eventually over-extend and deplete water and forage resources. Excessive utilization, trampling, and trailing by wild horses and burros would degrade the burned over rangelands, and would prevent the improvement of rangeland that is already in a lowered condition, and would not allow for sufficient availability of forage and water for either wild horses/burros or wildlife.

Movement outside of the HMAs by wild horses and burros would be expected as greater numbers of animals search for food and water for survival, thus impacting larger areas of public lands. Heavy to excessive utilization of the available forage would be expected and the water available for use could become increasingly limited. Eventually, plant communities would be damaged to the extent that they are no longer sustainable and the wild horse populations would be expected to crash.

4.8.3 Cumulative Impacts of Alternative A to Wild Horses and Burros

The Rush Fire burned 307,718 acres within the Twin Peaks HMA, which is 39% of the total acres, and also burned 7,860 acres of the Buckhorn HMA. The overall vegetation burn severity was High, with 85-95% of all plants completely consumed by the fire. Native plants experienced very low moisture spring and summer growing conditions which resulted in severe drought conditions prior to the wildfire. The combination of these factors has resulted in extreme loss of forage resources for wild horses and burros and wildlife.

Severe drought conditions greatly compounded the effects of the Rush Fire on native vegetation and forage and water resources. The Bull Flat weather station recorded an average annual precipitation of 6.6 inches over the previous 11 years, and in 2012 recorded 4.5 inches of precipitation from the beginning of the water year (October 1, 2011) until the fire started in August. In the months of May through August, 2012, only 0.3 inch of precipitation was recorded, for a total of 4.8 inches.

The BLM has estimated that native grass production grew only 20 to 30% of normal in 2012

at low elevations, and only 40 to 50% of normal production at mid to high elevations grew (Wilson, 2012). These conditions have substantially reduced the forage availability for wild horses and burros in the HMAs pre-fire, and continue to affect forage growth in unburned areas of the HMAs. In addition, approximately 50% of the developed pits and reservoirs that usually contain water into the fall were dry by early to mid-summer in 2012 (Farris, 2012). Many riparian and spring sites experienced higher use levels from livestock, wild horses, and wildlife pre-fire due to water shortage in adjacent areas.

Due to the loss of forage due to wildfire and drought, the original appropriate management level for the Twin Peaks HMA is no longer valid, and the HMA can no longer support this level of wild horses and burros. All of the division fences within and between other HMAs have been partially or totally destroyed by the fire, so the horses and burros can now move freely into other HMAs. This has created very large populations in the unburned portions of the HMAs.

The emergency stabilization and rehabilitation treatments included in the Proposed Action are needed in their entirety to protect rangeland resources and wildlife habitat. Cumulative effects expected would include continued improvement of upland and riparian vegetation conditions, which would in turn benefit native wildlife, and wild horses and burros as forage (habitat) quantity and quality is improved over the current level. Benefits from reduced wild horse and burro populations would include fewer animals competing for limited water quantity and at limited sites. Cumulatively there should be more stable wild horse and burro populations, healthier rangelands, healthier wild horses and burros, and fewer multiple use conflicts within the cumulative area over the short and long-term.

4.8.4 Cumulative Impacts of Alternative B to Wild Horses and Burros

If the current number of wild horses and burros within and adjacent to the Rush Fire area are not removed in the winter of 2012, many of these animals will succumb to malnutrition, disease, and/or starvation and death. In addition, this would exacerbate the deterioration in upland rangeland and riparian/wetland conditions documented at the current level of the wild horse and burro populations. This would result in the depletion of forage and water resources that would eventually lead to a decline of the body condition of the horses and burros, ultimately resulting in catastrophic losses to the herds. Wild horses and burros are not self-regulating species, and they would continue to reproduce until their habitat could no longer support them. The condition of the habitat would become severely damaged before the wild horse or burro populations would show substantial death loss.

Significant loss of the wild horses or burros in the HMA due to starvation or lack of water would have obvious consequences to the long-term viability of the herd. The BLM would be violating several policies, including the WFRHBA, by allowing this to occur. Continued decline of rangeland health and irreparable damage to vegetation, soil and riparian resources, would have obvious impacts to the future of the land within the HMA, and all other users of the resources, which depend upon them for survival. As a result, Alternative B would not ensure healthy rangelands that would allow for healthy, self-sustaining wild horse and burro populations, and would not promote a thriving ecological balance.

Additional emergency removals could be expected in the near future in order to prevent individual animals from suffering or death as a result of insufficient forage and water. During continued emergency conditions, competition for available forage and water continues to increase. This competition generally impacts the oldest and youngest horses as well as lactating mares first. These groups would experience substantial weight loss and diminished health, which could lead to their prolonged suffering and eventual death. If emergency actions are not taken, the overall population could be affected by severely skewed sex ratios towards stallions as they are generally the strongest and healthiest portion of the population. An altered age structure would also be expected.

While some members of the public have advocated "letting nature take its course", allowing horses or burros to die of dehydration and starvation would be inhumane treatment and would be contrary to the WFRHBA, which mandates the removal of excess wild horses and burros related to available forage and habitat conditions. In addition the WFRHBA mandates the humane treatment of the animals. The damage to rangeland resources that results from excess animals is also contrary to the WFRHBA, which mandates the Bureau to "*protect the range from the deterioration associated with overpopulation*", "*remove excess animals from the range so as to achieve appropriate management levels*", and *"to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area"*.

Promulgated Federal Regulations at Title 43 CFR § 4700.0-6 (a) state "*Wild horses shall be managed as self- sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat"* (emphasis added). Allowing excess wild horses and burros to remain within the burned areas would be inconsistent with the mandates of the WFRHBA and other regulations.

Cumulative impacts from Alternative B would result in foregoing the opportunity to improve rangeland health and to properly manage wild horses and burros in balance with the available forage and water resources and other multiple uses. Attainment of site-specific vegetation management objectives and Standards for Rangeland Health would not be achieved.

4.9 Effects on Livestock Grazing

4.9.1 Effects of Alternative A (Proposed Action) on Livestock Grazing

Temporary livestock closures would, in the short term, remove livestock from previously grazed areas, thereby resulting in a reduction of available animal use months (AUM) to livestock for at least the first two growing seasons following the fire. These closures would have short term adverse effects to livestock producers and their operations. However, these temporary closures would substantially improve the chance of successful re-vegetation of the burned areas. Alternative A would benefit livestock grazing in the long term through reseeding and the allowance of plants to recover from the fire and revegetate naturally without disturbance. Once the seeded and natural regeneration areas are sufficiently recovered, the forage base would be improved with herbaceous and palatable/nutritious species. The successful recovery of burned plants will ensure that the grazing allotments will contain

sufficient forage for sustainable livestock grazing into the future. The overall results will be productive, healthy, and resilient plant communities.

The Proposed Action would repair and rebuild 11 miles of existing permanent drift and pasture division fences that were burned by the Rush Fire. These fences would allow for the return of livestock to the allotments after the closures have expired, and would allow for the allotments to be grazed again according to the terms and conditions of the grazing permit. In addition, the Proposed Action would remove excess sediment and debris from 100 water catchments that resulted from increased watershed flow from the burned areas of the Rush Fire. The functioning of these water sources is critical to the success of the overall grazing management strategy within each allotment, and would allow for improved livestock health and grazing distribution.

Implementation of *Erosion Control and Vegetation Restoration Treatments* would speed up the revegetation process on most of the burned sites, and prevent the spread of noxious weeds and invasive plants. Alternative A would benefit livestock forage resources in the long term through reseeding on up to 32,000 acres, and the allowance of plants to revegetate naturally without disturbance from livestock grazing for two growing seasons. Once the seeded and natural regeneration areas are sufficiently recovered, the forage base would be consist of improved and palatable/nutritious plant species.

The Proposed Action would be successful in controlling the spread of nine noxious weed species within the fire perimeter through chemical and manual treatments. These actions would reduce the likelihood of invasive non-native plant species becoming established and out-competing native plants for available resources. These treatments would improve the overall plant composition and productivity of native plants, thereby improving the forage base for livestock grazing.

Reducing the populations of wild horses and burros would significantly reduce damage to burned soils resulting from trampling, and from overgrazing of vegetation, particularly in unburned islands and riparian/wetland sites, where the wild horses and burros tend to concentrate. This action would improve overall upland and riparian/wetland health, enhance the productivity of native plant communities, and improve the forage base for livestock in the long term.

4.9.2 Effects of Alternative B (No Action) on Livestock Grazing

The No Action Alternative would result in adverse effects to both upland vegetation resources and riparian/wetland sites that were severely burned. Short term recovery would not occur without seeding in the Moderate to High burn severity areas of the sagebrush dominated communities. In sites that are in early or mid–seral condition, with only a few perennial grasses, the chances are high that the burned area could become dominated by cheatgrass.

Some un-burned and burned vegetative communities could recover naturally without any proposed treatments. However, because of the large size of the Rush Fire there would be high grazing use on the un-burned islands from livestock and wild horses, since there would be no

reduction in grazing. Most ecological sites within the fire perimeter were meeting the standards for Upland Soils, but were not meeting the Biodiversity Standard, pre-fire. Adverse impacts to upland vegetation would be seen first on severely burned sites, and on sites that are already close to crossing an ecological successional threshold, or on sites that are closer to water sources. Alternative B would result in continued grazing by livestock and wild horses, compounding adverse impacts to upland and riparian vegetation, soils, and water sources and therefore reducing plant composition and productivity. The amount of damage to plant communities from overgrazing and trampling that would result from this alternative would have the potential to reduce the overall forage base for livestock well into the future.

Under Alternative B the BLM would not repair and rebuild 11 miles of existing permanent drift and pasture division fences that were burned by the Rush Fire, and would not remove excess sediment and debris from 100 water catchments. Without these fences and water sources it would be difficult for livestock operators to graze the allotments according to the terms and conditions of their grazing permit. Available forage and water resources for livestock would be drastically reduced.

4.9.3 Cumulative Effects to Livestock Grazing

Alternative A would result in short term adverse cumulative effects and long term beneficial effects to livestock grazing. Maintaining a balance of grazing animals, and controlling the amount of forage that is consumed each year by livestock and wild horses is crucial to allowing healthy plant communities that provide important forage for livestock to recover from the effects of wildfire. By temporarily reducing the grazing of livestock and wild horses and burros as described in the Proposed Action, cumulative impacts to livestock grazing are not expected to occur. Alternative A would also benefit livestock grazing in the long term through reseeding and rebuilding of pasture fences. Once the seeded and natural regeneration areas are sufficiently recovered, the forage base would be improved with palatable and nutritious species. The successful recovery of burned plants will ensure that the grazing allotments will contain sufficient forage for sustainable livestock grazing into the future. The overall results will be productive, healthy, and resilient plant communities.

Alternative B would result in adverse cumulative effects to livestock grazing. Through the land-use planning process and grazing permit renewal decisions, livestock grazing permits have been set at levels that balance forage resources between livestock and wild horses and burros. When either livestock numbers or wild horse and burro numbers become higher than the available forage resources can sustain, overall impacts to forage resources are higher, as more forage is consumed in the same time periods. This does not allow the livestock grazing systems to function as they have been designed, as in actuality, no rest occurs on forage plants before they can recover from the effects of wildfire or other disturbances. Without the replacement of boundary and pasture fences and the maintenance of water sources it would be difficult for livestock operators to graze the allotments according to the terms and conditions of their grazing permit. Available forage and water resources for livestock would be drastically reduced in the long term..

4.10 Effects on Recreation Facilities and Human Safety

4.10.1 Effects of Alternative A (Proposed Action) on Recreation and Human Safety

Under Alternative A the BLM would replace and rebuild 14 public information signs that need to be replaced to assist with visitor safety. These signs are designed to help visitors with the knowledge of which route they are on, which is important for overall awareness and in case of an emergency. The replacement of these signs would support the continued safe use of the BLM lands for hunting, ATV and motorcycle riding, hiking, horseback riding, and wildlife observation and other recreation activities.

The BLM has identified approximately 40 burnt trees adjacent to Buckhorn Backcountry Byway and Rye Patch Road that have been identified to be hazardous to human safety as these are frequently traveled access roads. Hazard tree removal would ensure human safety along identified roads during any human activities. The complete removal of hazardous trees from identified roadsides will eliminate risks to human life and safety.

4.10.2 Effects of Alternative B (No Action) on Recreation and Human Safety

The No Action Alternative would result in moderate to high risks to human safety from the lack of informational road signs, and from the presence of burned hazard trees along key travel routes. Without informational signs visitors would be at more risk of becoming lost or disoriented in the vast and remote high desert landscape. In addition, visitors could become injured from falling burned trees along some of the key travel routes.

4.10.3 Cumulative Effects to Recreation and Human Safety

Due to the large extent of the Rush Fire, visitor use of BLM lands for recreation has been adversely impacted by the loss of native vegetation, impaired visual quality of the landscape, and reduced quality of wildlife habitat. Alternative A would have beneficial impacts to recreation and public safety by removing hazards and keeping the public informed of key road locations.

Alternative B would have adverse cumulative impacts by allowing the fire to continue to pose human safety risks and hazards.

5.0 CONSULTATION

Tribal Consultations have been ongoing throughout 2012, and the BLM has discussed the implications of the Rush Fire and proposed treamtnents. Tribal Consultation with the Greenville Rancheria was conducted on 1/19/2012, 5/18/2012, 07/05/2012 and 10/11/2012; with the Pit River Tribe on 10/06/2011, 1/5/2012, 4/5/2012, 07/05/2012 and 10/04/2012; with Pyramid Lake Paiute Tribe on 11/02/2011, 1/19/2012 4/26/2012, and 07/02/2012; with Reno-Sparks Indian Colony on 11/17/2011, 4/6/2012, 07/02/2012 and 09/19/2012; with the Susanville Indian Rancheria on 10/20/2011, 1/6/2012, 4/6/2012, 07/06/2012, and 10/05/2012; and with the Washoe Tribe of Nevada and California on 11/01/2011, 1/19/2012, 4/4/2012, 07/02/2012 and 11/13/2012.

Coordination with State and Federal wildlife agencies was conducted throughout this process regarding threatened and endangered and special status species, primarily relating to the destruction of habitat for greater sage-grouse, mule deer and pronghorn. Information obtained through coordination was incorporated into this document.

6.0 LIST OF PREPARERS AND SPECIALISTS CONSULTED

Name	Title/Resource Specialty	Project Role
Dereck Wilson	Supervisory Rangeland Mgt. Specialist	EA Lead; ES&R Team Leader
Dianna Brink	State Rangeland Mgt. Specialist	ES&R State Lead/Range Lead
Sue Noggles	Planning and Environmental Coordinator	EA Preparer
Valda Lockie	Ecologist/Special Status Plants	EA Input; ES&R Team
Patrick Farris	Rangeland Mgt. Specialist	EA Input; ES&R Team
Sharynn Blood	Cultural/Paleontological Resources	EA Input; ES&R Team
John Parsons	Wild Horse and Burro Specialist	EA Input; ES&R Team
Missi Nelson	Wildlife Biologist	EA Input; ES&R Team
Landon Gryczkowski	Hydrologist	EA Input; ES&R Team
Matt May	Range Technician	EA Input; ES&R Team
Josh Huffman	Weed Specialist	EA Input; ES&R Team
Jim Hunt	Recreational Maintenance Worker	EA Input; ES&R Team
Clif Motheral	Resource Advisor	ES&R Team
Andrew Johnson	Botanist/GIS Specialist	EA Input; ES&R Team
Janyne Little	Botanist	ES&R Team
William Sims	Soil Scientist	EA Input; ES&R Team
Chuck Jachens	Hydrologist	EA Input; ES&R Team
Scott Soletti	Wildlife Biologist	EA Input; ES&R Team
Lily Douglas	Wildlife Biologist	EA Input; ES&R Team
Linn Gassaway	Archaeologist	ES&R Team
Dan Hall	Archaeologist	ES&R Team
William Reed	Archaeologist	ES&R Team
Erika Karuzas	Archaeologist	ES&R Team
Julie Rodman	Archaeologist	ES&R Team
Jenna Matthews	Archaeologist	ES&R Team

7.0 REFERENCES

1. Barber, M.R., Fayrer-Hosken, R.A. 2000. Evaluation of Somatic and Reproductive Immunotoxic Effects of the Porcine Zona Pellucida Vaccination. *Journal of Experimental Zoology*, Volume 286, Issue 6, pages 641–646.

2. Beever, Erik. Alan and Peter F. Brussard. 2000. Examining Ecological Consequences of Feral Horse Grazing Using Exclosures. *Western North American Naturalist* 60:236-254.

3. Beever, Erik. Alan and Peter F. Brussard. 2004. Community- and Landscape-Level Responses of Reptiles and Small Mammals to Feral-Horse Grazing in the Great Basin. *Journal of Arid Environments* 59:271-297.

4. Berger, Joel. 1986. *Wild Horses of the Great Basin: Social Competition and Population Size*. Univ. of Chicago Press. Chicago & London.

5. Blake, E. W. 1997. *Soil Survey of Washoe County, Nevada, Central Part*. U.S. Department of Agriculture, Natural Resources Conservation Service in cooperation with the U.S. Department of the Interior, Bureau of Land Management and Bureau of Indian Affairs, and the University of California Agricultural Experiment Station. Washington, D.C., Government Printing Office.

6. Coates, P. S., Connelly, J. W. and Delehanty, D. J. 2008. Predators of Greater Sage Grouse nests identified by video monitoring. *Journal of Field Ornithology*, 79: 421–428.

7. Connelly, John W., Schroeder, Michael A., Sands, Alan R., and Braun, Clait E. Guidelines to Manage Sage Grouse Populations and Their Habitats. *Wildlife Society Bulletin* Vol. 28, No. 4 (Winter, 2000), pp. 967-985.

8. Cooper, D.W. and Larsen, E. 2006. *Immunocontraception of mammalian wildlife: ecological and immunogenetic issues.* Australian and New Zealand Conservation Laboratories, School of Biological, Earth and Environmental Sciences, The University of New South Wales, Sydney, New South Wales 2052, Australia

9. Evans, J. Warren, Bortan, A., Hinz H., Van Vlock, L. 1970. The Horse. Page 357.

10. Fleischner, T. L. (1994), Ecological Costs of Livestock Grazing in Western North America. Conservation Biology, 8: 629–644.

11. Ganskopp, D.C. and M. Vavra. 1986. Habitat Use by Feral Horses in the Northern Sagebrush Steppe. Journal of Range Management 39(3):207-211.

12. Ganskopp, D.C. and M. Vavra. 1987. Slope Use by Cattle, Feral Horses, Deer, and Bighorn Sheep. Northwest Science, 61(2):74-80.

13. Garrott, R.A., Taylor, L. 1990. Dynamics of a Feral Horse Population in Montana. *Journal of Wildlife Management*, 54 (4): 603-612.

14. Garrott, R. A., D. B. Siniff, and L. L. Eberhardt. 1991. Growth rates of feral horse populations. J. Wildl. Manage. 55:641-648.

15. Heleski, C., Greene, B., Ralston, S., Stull, C. 2010. *Independent Designated Observer Pilot Program Final Report.* American Horse Protection Association Report to BLM. October, 2010.

16. Henneke, D. R. 1983. Relationship Between Condition Score, Physical Measurements and Body Fat Percentage in Mares. *Equine Veterinary Journal*. 15(4), 371-372

17. Jenkins, S.H. 1989. Comments on an Inappropriate Population Model for Feral Burros. *Journal of Mammalogy*, Vol. 70, No. 3 (Aug, 1989), pp. 667-670.

18. Jepson, W. L., & Hickman, J. C. (1996). The Jepson Manual: Higher plants of California. Berkeley: University of California Press.

19. Kirkpatrick, Jay F. and Fazio, Patricia M. 2010. *Wild Horses as Native North American Wildlife*. The Science and Conservation Center, ZooMontana, Billings. 8 pages.

20. Kirkpatrick, Jay F. and Fazio, Patricia M. 2009. *Immunocontraceptive Reproductive Control Utilizing Porcine Zona Pellucida (PZP)in Federal Wild Horse Populations* (Second Edition). http://www.zoomontana.org/conservation_center/pzp_q_and_a.pdf

21. Kirkpatrick, J., 1995, Management of Wild Horses by Fertility Control: The Assateague Experience: Scientific Monograph NPS/NRASIS/NRSM-96/26, U.S. Department of Interior, National Park Service, 60 p.

22. Knick, S. T., and J. W. Connelly (editors). 2011. Greater Sage-Grouse: Ecology and conservation of a landscape species and its habitats. Studies in Avian Biology Series (vol. 38), University of California Press, Berkeley, CA.

23. McInnis, M.A. and M. Vavra. 1987. Dietary relationships among feral horses, cattle, and pronghorn in southeastern Oregon. Journal of Range Mgt 40(1):60-66.

24. Miller, R. 1983. Habitat Use of Feral Horses and Cattle in Wyoming's Red Desert. *Journal of Range Management*, Vol. 36, No. 2 pp. 195-199.

25. Miller, R. F., and L. L. Eddleman. 2001. Spatial and temporal changes of sagegrouse habitat in the sagebrush biome. Agricultural Experiment Station Technical Bulletin 151. Oregon State University, Corvallis, USA.

26. Northeast California Sage-grouse Working Group. 2006. Conservation Strategy for Sage-Grouse (*Centrocercus urophansianus*) and Sagebrush Ecosystems within the Massacre and Vya Populations Management Unit.

27. Nunez, Cassandra, 2009. *Management Of Wild Horses With Porcine Zona Pellucida: History, Consequences, And Future Strategies.* In: Horses: Biology, Domestication, and Human Interactions ISBN: 978-1-61761-303-6. Editor: James E. Leffhalm © 2009 Nova Science Publishers, Inc.

28. O'Gara, B. 1978. Antilocapra americana. *Mammalian Species*. Number 90: 1-7.

29. Pellant, Mike, David.A. Pyke, Patrick. Shaver, and Jeffrey E. Herrick. 2000. *Interpreting Indicators of Rangeland Health Version 3*. BLM Technical. Reference. 1734-6. Denver: U.S. Department of the Interior, Bureau of Land Management, National Science and Technology Center.

30. Pyshora, L. 1977. The pronghorn antelope in northeastern California. Department of Fish and Game Wildlife Management Administrative Report, Number 77-2. 46 pages.

31. Reynolds, T. D. 1984. Daily summer movements, activity patterns, and home range of pronghorn. *Northwest Sci*. 58:300-311.

32. Sager, Stephanie. 1992. A population ecology study of feral horses on Hog Ranch Bare Allotment, Washoe County, Nevada. MS thesis, California State University, Sacramento.

33. Singer, F.J., Osborne, R. 2000. *Development and Assessment of Tools That Managers Could use to Monitor Wild Horse Populations*. Resource Notes No. 32. Resource Ecology Lab Colorado State University.

34. Séquin, Eveline. 2004. Bureau of Land Management Eagle Lake Field Office Pygmy Rabbit (*Brachylagus idahoensis*) Survey: May-September 2004. Reno, NV: University of Nevada, Reno, Program in Ecology, Evolution, and Conservation Biology.

35. Slusser, Steve 1999. Soil Survey of Washoe County, Nevada, North Part. USDA Natural Resources Conservation Service in cooperation with the Bureau of Land Management and the University of Nevada Agriculture Experiment Station. U.S. Government Printing Office.

36. Turer Jr., J.W., I.K.M. Lui, Rutberg, A., J.W., Kirkpatrick. 1997. Immunocontraception Limits Foal Production in Free Roaming Feral Horses in Nevada, J. Wildl. Manage. 61 (3):873-880.

37. Turner Jr., J.W., I.K.M. Lui, Rutberg, A., J.W., Kirkpatrick. 1997. Immuno-contraception Limits Foal Production in Free Roaming Feral Horses in Nevada, *J. Wildl. Manage*. 61 (3):873-880.

38. Tri-State Operational Working Group, 2010. Bureau of Land Management and U.S. Fish and Wildlife Service. Memorandum of Understanding No. NV-91010-001.

39. U.S. Code, Wild Free Roaming Horse and Burro Act of 1971, 43 U.S.C 1331–1340, 43 CFR 4700.

40. United States Department of the Interior, Interior Board of Land Appeals. 2010. IBLA 2009-246. MT-COI0-2009-0001.

41. U.S. Department of the Interior, Bureau of Land Management. 2012. Instruction Memorandum No. 2012-045: New Program Measures for Wild Horse and Burro Program.

42. U.S. Department of the Interior, Bureau of Land Management. 2011. A Report on National Greater Sage-grouse Conservation Measures. December 2011, page 18.

43. U.S. Department of the Interior, Bureau of Land Management. 2011. Instruction Memorandum No. 2012-043: Greater Sage-grouse Interim Management Policies and Procedures.

44. U.S. Department of the Interior, Bureau of Land Management. 2011. Instruction Memorandum No. 2011-193: FY 2012 "Director's Challenge": Expanding Volunteer Engagement in Monitoring and Sustaining the Health of BLM Wild Horse and Burro Herd Management Areas.

45. U.S. Department of the Interior, Bureau of Land Management. 2011. Instruction Memorandum No. 2011-040: Protocols for Media at Wild Horse and Burro Gathers.

46. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-057: Wild Horse and Burro Population Inventory and Estimation.

47. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-130, Change 1. Wild Horse and Burro Gather Decisions.

48. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-135. Gather Policy, Selective Removal Criteria, and Management Considerations for Reducing Population Growth Rates.

49. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-162: Wild Horse and Burro Gather Daily Reporting Policy, Internal Communications Protocols.

50. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-164: Public Observation of Wild Horse and Burro Gathers.

51. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-183: Helicopter Capture of Wild Horses and Burros.

52. U.S. Department of the Interior, Bureau of Land Management. 2010. Twin Peaks Herd Management Area Fact Sheet.

53. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-041: Change 1 to Washington Office Instruction Memorandum No. 2009-041- Euthanasia of Wild Horses and Burros for Reasons Related to Health, Handling and Acts of Mercy.

54. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-062: Wild Horse and Burro Genetic Baseline Sampling.

55. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-063: Gelding of Wild Horses and Burros and Gelding Vouchers.

56. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-074: Wild Horse and Burro Vaccinations in Short-term Holding Facilities.

57. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-090: Population-Level Fertility Control Field Trials: Herd Management Area (HMA) Selection, Vaccine Application, Monitoring and Reporting Requirements.

58. U.S. Department of the Interior, Bureau of Land Management. 2009. Wild Horse and Burro Aviation Management Handbook.

59. United States Department of the Interior, Bureau of Land Management. 2007. BLM Instruction Memorandum No. 2008-050. Migratory Bird Treaty Act- Interim Management Guidance.

60. U.S. Department of the Interior, Bureau of Land Management. 2006. Environmental Assessment, CA-350-2006-29, *Twin Peaks Herd Management Area Wild Horse and Burro Gather.*

61. U.S. Department of the Interior, Bureau of Land Management. 2002. BLM Instruction Memorandum No. 2002-095: Gather Policy and Selective Removal Criteria for Wild Horses.

62. U.S. Department of the Interior, Bureau of Land Management. 1998. Observation Allotment Monitoring Evaluation Report, CA-350-1998-20.

63. U.S. Department of the Interior, Bureau of Land Management. 1995. The Interim Management Policy for Lands under Wilderness Review, BLM H-8550-1, Chapter IIIE, Wild Horse and Burro Management.

64. U.S. Department of the Interior, Bureau of Land Management. 1989. Twin Peaks Herd Management Area Plan, CA-242.

65. U.S. Department of the Interior, Bureau of Land Management. 1988. *Grazing Reductions of Livestock and Wild Horses in the Cal Neva Planning Unit.*

66. U.S. Department of the Interior, Bureau of Land Management. 1982. Cal-Neva Management Framework Plan.

67. U.S. Department of the Interior, Secretary of the Interior, 2009. Letter to Senator Harry Reid from Ken Salazar.

68. United States Government Accountability Office, October 2008, GAO-09-77, Effective Long-Term Options Needed to Manage Unadoptable Wild Horses

69. Zeiner, D. C., et al. 1990. California's Wildlife. Volume III: Mammals. State of California. The Resources Agency. Sacramento, California.

APPENDIX A

Standard Operating Procedures for Wild Horse (or Burro) Gathers

Gathers are conducted by utilizing contractors from the Wild Horse (or Burros) Gathers-Western States Contract or BLM personnel. The following procedures for gathering and handling wild horses apply whether a contractor or BLM personnel conduct a gather. For helicopter gathers conducted by BLM personnel, gather operations will be conducted in conformance with the *Wild Horse Aviation Management Handbook* (January 2009).

Prior to any gathering operation, the BLM will provide for a pre-capture evaluation of existing conditions in the gather area(s). The evaluation will include animal conditions, prevailing temperatures, drought conditions, soil conditions, road conditions, and a topographic map with wilderness boundaries, the location of fences, other physical barriers, and acceptable trap locations in relation to animal distribution. The evaluation will determine whether the proposed activities will necessitate the presence of a veterinarian during operations. If it is determined that a large number of animals may need to be euthanized or capture operations could be facilitated by a veterinarian, these services would be arranged before the capture would proceed. The contractor will be apprised of all conditions and will be given instructions regarding the capture and handling of animals to ensure their health and welfare is protected.

Trap sites and temporary holding sites will be located to reduce the likelihood of injury and stress to the animals, and to minimize potential damage to the natural resources of the area. These sites would be located on or near existing roads whenever possible.

The primary capture methods used in the performance of gather operations include:

1. Helicopter Drive Trapping. This capture method involves utilizing a helicopter to herd wild horses into a temporary trap.
2. Helicopter Assisted Roping. This capture method involves utilizing a helicopter to herd wild horses or burros to ropers.
3. Bait or Water Trapping. This capture method involves utilizing bait (e.g., water or feed) to lure wild horses into a temporary trap.

The following procedures and stipulations will be followed to ensure the welfare, safety and humane treatment of wild horses in accordance with the provisions of 43 CFR 4700.

A. Capture Methods used in the Performance of Gather Contract Operations

1. The primary concern of the contractor is the safe and humane handling of all animals captured. All capture attempts shall incorporate the following:
    a. All trap and holding facilities locations must be approved by the Contracting Officer's Representative (COR) and/or the Project Inspector (PI) prior to construction. The Contractor may also be required to change or move trap locations as determined by the COR/PI. All traps and holding facilities not located on public land must have prior written approval of the landowner.

2. The rate of movement and distance the animals travel shall not exceed limitations set by the COR/PI who will consider terrain, physical barriers, weather, condition of the animals and other factors. Under normal circumstances this travel should not exceed 10 miles and may be much less dependent on existing conditions (i.e. ground conditions, animal health, extreme temperatures (high and low)).
3. All traps, wings, and holding facilities shall be constructed, maintained and operated to handle the animals in a safe and humane manner and be in accordance with the following:
    a. Traps and holding facilities shall be constructed of portable panels, the top of which shall not be less than 72 inches high for horses and 60 inches for burros, and the bottom rail of which shall not be more than 12 inches from ground level. All traps and holding facilities shall be oval or round in design.
    b. All loading chute sides shall be a minimum of 6 feet high and shall be fully covered, plywood, metal without holes larger than 2"x4".
    c. All runways shall be a minimum of 30 feet long and a minimum of 6 feet high for horses, and 5 feet high for burros, and shall be covered with plywood, burlap, plastic snow fence or like material a minimum of 1 foot to 5 feet above ground level for burros and 1 foot to 6 feet for horses. The location of the government furnished portable fly chute to restrain, age, or provide additional care for the animals shall be placed in the runway in a manner as instructed by or in concurrence with the COR/PI.
    d. All crowding pens including the gates leading to the runways shall be covered with a material which prevents the animals from seeing out (plywood, burlap, plastic snow fence, etc.) and shall be covered a minimum of 1 foot to 5 feet above ground level for burros and 2 feet to 6 feet for horses
    e. All pens and runways used for the movement and handling of animals shall be connected with hinged self-locking or sliding gates.
4. No modification of existing fences will be made without authorization from the COR/PI. The Contractor shall be responsible for restoration of any fence modification which he has made.
5. When dust conditions occur within or adjacent to the trap or holding facility, the Contractor shall be required to wet down the ground with water.
6. Alternate pens, within the holding facility shall be furnished by the Contractor to separate mares or jennies with small foals, sick and injured animals, strays or other animals the COR determines need to be housed in a separate pen from the other animals. Animals shall be sorted as to age, number, size, temperament, sex, and condition when in the holding facility so as to minimize, to the extent possible, injury due to fighting and trampling. Under normal conditions, the government will require that animals be restrained for the purpose of determining an animal's age, sex, or other necessary procedures. In these instances, a portable restraining chute may be necessary and will be provided by the government. Alternate pens shall be furnished by the Contractor to hold animals if the specific gathering requires that animals be released back into the capture area(s). In areas requiring one or more satellite traps, and where a centralized holding

facility is utilized, the contractor may be required to provide additional holding pens to segregate animals transported from remote locations so they may be returned to their traditional ranges. Either segregation or temporary marking and later segregation will be at the discretion of the COR.

7. The Contractor shall provide animals held in the traps and/or holding facilities with a continuous supply of fresh clean water at a minimum rate of 10 gallons per animal per day. Animals held for 10 hours or more in the traps or holding facilities shall be provided good quality hay at the rate of not less than two pounds of hay per 100 pounds of estimated body weight per day. The contractor will supply certified weed free hay if required by State, County, and Federal regulation.

   An animal that is held at a temporary holding facility through the night is defined as a horse/burro feed day. An animal that is held for only a portion of a day and is shipped or released does not constitute a feed day.

8. It is the responsibility of the Contractor to provide security to prevent loss, injury or death of captured animals until delivery to final destination.

9. The Contractor shall restrain sick or injured animals if treatment is necessary. The COR/PI will determine if animals must be euthanized and provide for the destruction of such animals. The Contractor may be required to humanely euthanize animals in the field and to dispose of the carcasses as directed by the COR/PI.

10. Animals shall be transported to their final destination from temporary holding facilities as quickly as possible after capture unless prior approval is granted by the COR for unusual circumstances. Animals to be released back into the HMA following gather operations may be held up to 21 days or as directed by the COR. Animals shall not be held in traps and/or temporary holding facilities on days when there is no work being conducted except as specified by the COR. The Contractor shall schedule shipments of animals to arrive at final destination between 7:00 a.m. and 4:00 p.m. No shipments shall be scheduled to arrive at final destination on Sunday and Federal holidays, unless prior approval has been obtained by the COR. Animals shall not be allowed to remain standing on trucks while not in transport for a combined period of greater than three (3) hours in any 24 hour period. Animals that are to be released back into the capture area may need to be transported back to the original trap site. This determination will be at the discretion of the COR/PI or Field Office horse specialist.

B. Capture Methods That May Be Used in the Performance of a Gather

1. Capture attempts may be accomplished by utilizing bait (feed, water, mineral licks) to lure animals into a temporary trap. If this capture method is selected, the following applies:

   a. Finger gates shall not be constructed of materials such as "T" posts, sharpened willows, etc., that may be injurious to animals.

   b. All trigger and/or trip gate devices must be approved by the COR/PI prior to

capture of animals.

c. Traps shall be checked a minimum of once every 10 hours.

2. Capture attempts may be accomplished by utilizing a helicopter to drive animals into a temporary trap. If the contractor selects this method the following applies:

   a. A minimum of two saddle-horses shall be immediately available at the trap site to accomplish roping if necessary. Roping shall be done as determined by the COR/PI. Under no circumstances shall animals be tied down for more than one half hour.

   b. The contractor shall assure that foals shall not be left behind, and orphaned.

3. Capture attempts may be accomplished by utilizing a helicopter to drive animals to ropers. If the contractor, with the approval of the COR/PI, selects this method the following applies:

   a. Under no circumstances shall animals be tied down for more than one hour.

   b. The contractor shall assure that foals shall not be left behind, or orphaned.

   c. The rate of movement and distance the animals travel shall not exceed limitations set by the COR/PI who will consider terrain, physical barriers, weather, condition of the animals and other factors.

C. Use of Motorized Equipment

1. All motorized equipment employed in the transportation of captured animals shall be in compliance with appropriate State and Federal laws and regulations applicable to the humane transportation of animals. The Contractor shall provide the COR/PI, if requested, with a current safety inspection (less than one year old) for all motorized equipment and tractor-trailers used to transport animals to final destination.
2. All motorized equipment, tractor-trailers, and stock trailers shall be in good repair, of adequate rated capacity, and operated so as to ensure that captured animals are transported without undue risk or injury.
3. Only tractor-trailers or stock trailers with a covered top shall be allowed for transporting animals from trap site(s) to temporary holding facilities, and from temporary holding facilities to final destination(s). Sides or stock racks of all trailers used for transporting animals shall be a minimum height of 6 feet 6 inches from the floor. Single deck tractor-trailers 40 feet or longer shall have at least two (2) partition gates providing at least three (3) compartments within the trailer to separate animals. Tractor-trailers less than 40 feet shall have at least one partition gate providing at least two (2) compartments within the trailer to separate the animals. Compartments in all tractor-trailers shall be of equal size plus or minus 10 percent. Each partition shall be a minimum of 6 feet high and shall have a minimum 5 foot wide swinging gate. The use of double deck tractor-trailers is unacceptable and shall not be allowed.
4. All tractor-trailers used to transport animals to final destination(s) shall be equipped with

at least one (1) door at the rear end of the trailer which is capable of sliding either horizontally or vertically. The rear door(s) of tractor-trailers and stock trailers must be capable of opening the full width of the trailer. Panels facing the inside of all trailers must be free of sharp edges or holes that could cause injury to the animals. The material facing the inside of all trailers must be strong enough so that the animals cannot push their hooves through the side. Final approval of tractor-trailers and stock trailers used to transport animals shall be held by the COR/PI.

5. Floors of tractor-trailers, stock trailers and loading chutes shall be covered and maintained with wood shavings to prevent the animals from slipping as much as possible during transport.
6. Animals to be loaded and transported in any trailer shall be as directed by the COR/PI and may include limitations on numbers according to age, size, sex, temperament and animal condition. The following minimum square feet per animal shall be allowed in all trailers:

   11 square feet per adult horse (1.4 linear foot in an 8 foot wide trailer);

   8 square feet per adult burro (1.0 linear foot in an 8 foot wide trailer);

   6 square feet per horse foal (.75 linear foot in an 8 foot wide trailer);

   4 square feet per burro foal (.50 linear feet in an 8 foot wide trailer).
7. The COR/PI shall consider the condition and size of the animals, weather conditions, distance to be transported, or other factors when planning for the movement of captured animals. The COR/PI shall provide for any marking and/or inspection services required for the captured animals.
8. If the COR/PI determines that dust conditions are such that the animals could be endangered during transportation, the Contractor will be instructed to adjust speed.

D. Safety and Communications

1. The Contractor shall have the means to communicate with the COR/PI and all contractor personnel engaged in the capture of wild horses utilizing a VHF/FM Transceiver or VHF/FM portable Two-Way radio. If communications are ineffective the government will take steps necessary to protect the welfare of the animals.

   a. The proper operation, service and maintenance of all contractor furnished property is the responsibility of the Contractor. The BLM reserves the right to remove from service any contractor personnel or contractor furnished equipment which, in the opinion of the contracting officer or COR/PI violate contract rules, are unsafe or otherwise unsatisfactory. In this event, the Contractor will be notified in writing to furnish replacement personnel or equipment within 48 hours of notification. All such replacements must be approved in advance of operation by the Contracting Officer or his/her representative.

   b. The Contractor shall obtain the necessary FCC licenses for the radio system

   c. All accidents occurring during the performance of any task order shall be immediately reported to the COR/PI.

2. Should the contractor choose to utilize a helicopter the following will apply:

    a. The Contractor must operate in compliance with Federal Aviation Regulations, Part 91. Pilots provided by the Contractor shall comply with the Contractor's Federal Aviation Certificates, applicable regulations of the State in which the gather is located.

    b. Fueling operations shall not take place within 1,000 feet of animals.

E. Site Clearances

No personnel working at gather sites may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage or otherwise alter or deface any archaeological resource located on public lands or Indian lands.

Prior to setting up a trap or temporary holding facility, BLM will conduct all necessary clearances (archaeological, T&E, etc.). All proposed site(s) must be inspected by a government archaeologist. Once archaeological clearance has been obtained, the trap or temporary holding facility may be set up. Said clearance shall be arranged for by the COR, PI, or other BLM employees.

Gather sites and temporary holding facilities would not be constructed on wetlands or riparian zones.

F. Animal Characteristics and Behavior

Releases of wild horses would be near available water. If the area is new to them, a short-term adjustment period may be required while the wild horses become familiar with the new area.

G. Public Participation

Opportunities for public viewing (i.e. media, interested public) of gather operations will be made available to the extent possible; however, the primary considerations will be to protect the health, safety and welfare of the animals being gathered and the personnel involved. The public must adhere to guidance from the on-site BLM representative. It is BLM policy that the public will not be allowed to come into direct contact with wild horses or burros being held in BLM facilities. Only authorized BLM personnel or contractors may enter the corrals or directly handle the animals. The general public may not enter the corrals or directly handle the animals at any time or for any reason during BLM operations.

H. Responsibility and Lines of Communication

Contracting Officer's Representative/Project Inspector

Contracting Officer's Representative/Project Inspector

The Contracting Officer’s Representatives (CORs) and the project inspectors (PIs) have the direct responsibility to ensure the Contractor’s compliance with the contract stipulations. The

Assistant Field Managers for Resources and Field Managers will take an active role to ensure the appropriate lines of communication are established between the field, Field Office, State Office, National Program Office, and BLM Holding Facility offices. All employees involved in the gathering operations will keep the best interests of the animals at the forefront at all times.

All publicity, formal public contact and inquiries will be handled through the Assistant Field Managers for Renewable Resources and Field Office Public Affairs. These individuals will be the primary contact and will coordinate with the COR/PI on any inquiries.

The COR will coordinate with the contractor and the BLM Corrals to ensure animals are being transported from the capture site in a safe and humane manner and are arriving in good condition.

The contract specifications require humane treatment and care of the animals during removal operations. These specifications are designed to minimize the risk of injury and death during and after capture of the animals. The specifications will be vigorously enforced.

Should the Contractor show negligence and/or not perform according to contract stipulations, he will be issued written instructions, stop work orders, or defaulted.

APPENDIX B – SEED MIXES

Drill Seeding – Wyoming Big Sagebrush Plant Association

Scientific Name	Common Name	Cultivar	Seeding Rate[1/] (pounds/acre)
Pseudoroegneria spicata	Bluebunch Wheatgrass	Anatone	1.3
Elymus elymoides ssp. Californicus	Squirreltail	Toe Jam Creek	0.75
Poa secunda ssp. secunda	Sandberg Bluegrass	Mountain Home	0.7
Linum lewisii	Lewis Flax	Columbia	0.66
Artemisia tridentata wyomingensis	Wyoming Big Sagebrush	Oneida County	6.25
Purshia tridentata	Antelope Bitterbrush	Elko County NV	1.3

Drill Seeding – Basin Big Sagebrush Plant Association

Scientific Name	Common Name	Cultivar	Seeding Rate[1/] (pounds/acre)
Pseudoroegneria spicata	Bluebunch Wheatgrass	Anatone	1.3
Leymus cinereus	Great Basin Wildrye	Magnar	1.3
Artemisia tridentata tridentata	Basin Big Sagebrush	White Pine County NV	6.25
Purshia tridentata	Antelope Bitterbrush	Elko County NV	1.3
Achillea millefolium		Common Yarrow	0.3

Drill Seeding – Mountain Big Sagebrush Plant Association

Scientific Name	Common Name	Cultivar	Seeding Rate[1/] (pounds/acre)
Pseudoroegneria spicata	Bluebunch Wheatgrass	Anatone	1.3
Festuca idahoensis	Idaho fescue	Nezpurs	1.2
Artemisia tridentata vaseyana	Mountain Big Sagebrush	Beaver County UT	6.25
Purshia tridentata	Antelope Bitterbrush	Elko County NV	1.3
Crepis spp.	Hawksbeard		0.3

Aerial Seeding – Mountain and Wyoming Big Sagebrush Plant Associations

Scientific Name	Common Name	Cultivar	Seeding Rate[1/] (pounds/acre)
Pseudoroegneria spicata	Bluebunch Wheatgrass	Anatone	1.3
Elymus elymoides ssp. Californicus	Squirreltail	Toe Jam Creek	0.75
Poa secunda ssp. secunda	Sandberg Bluegrass	Mountain Home	0.7
Artemisia tridentata vaseyana *or*	Mountain Big Sagebrush	Beaver County UT	6.25
Artemisia tridentata wyomingensis	Wyoming Big Sagebrush	Oneida County	6.25

[1/] Seeding rates are approximate and would be finalized prior to seeding based on seed availability.